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MUNICIPAL CONSULTATION FILING
Connecticut General Statutes Section 16-50*l* (e)

FOR A

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

FOR THE

Waterford Parkway North Substation

Waterford Parkway North and Oil Mill Road
Waterford, Connecticut

April 2008

Submitted to:

Town of Waterford Chief Elected Official
Waterford, Connecticut

Submitted by:

The Connecticut Light & Power Company
107 Selden Street
Berlin, CT 06037

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A. SUMMARY DESCRIPTION AND LOCATION OF THE PROJECT

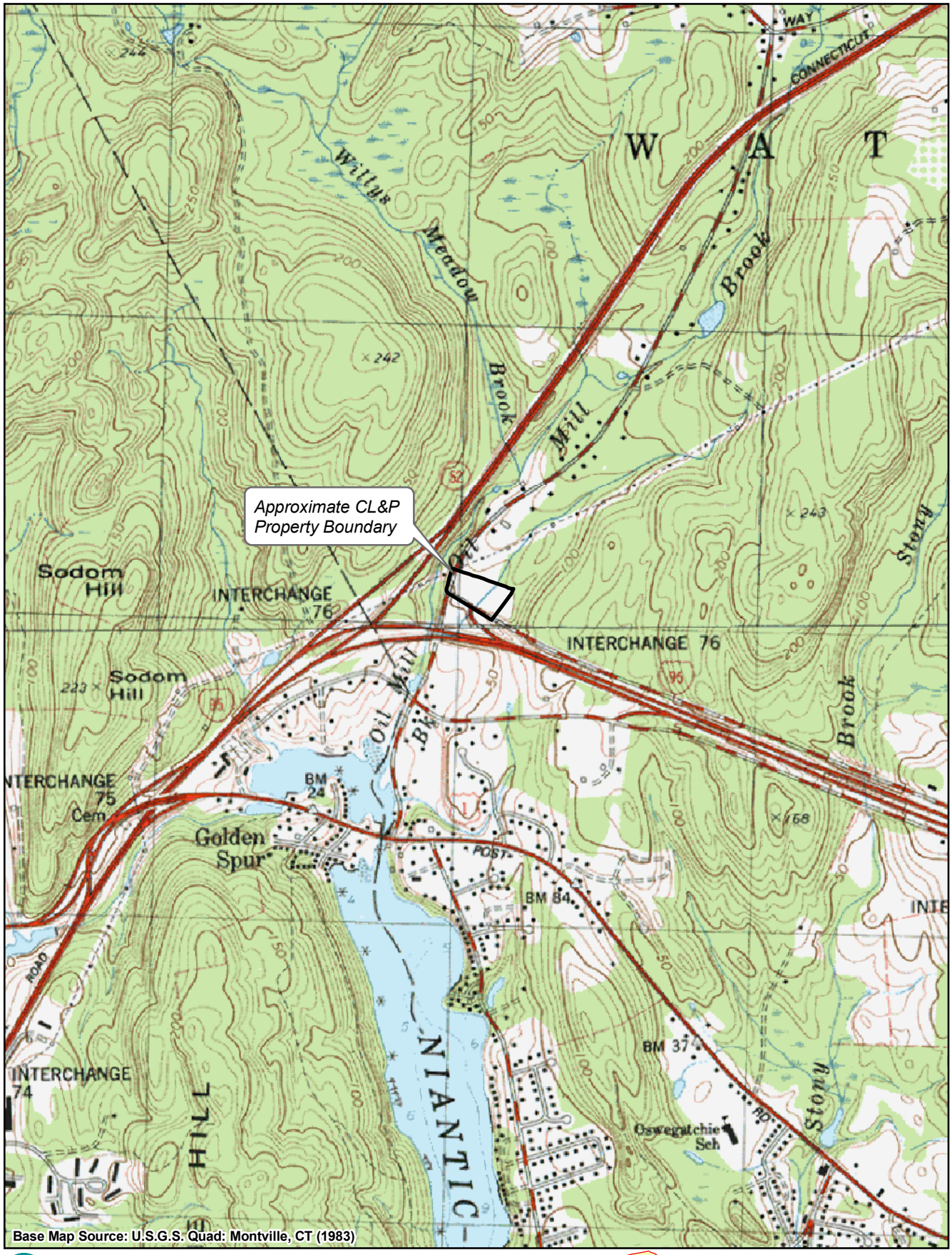
The Applicant, The Connecticut Light and Power Company ("CL&P"), seeks to construct a new bulk power 115 to 23-kilovolt ("kV") substation (the "Substation") on property located at 325 Waterford Parkway North in Waterford, Connecticut (the "Property" or "Site"). The Substation will add needed distribution delivery-system capacity to serve the growing electric power demands in the Town of Waterford, a town that does not currently have its own bulk power substation source, as well as portions of adjacent towns. The Substation will be strategically positioned to facilitate connection to an existing 115-kV transmission circuit that lies just north of the Property.

The existing distribution system supplying the Town of Waterford lacks the capacity and reliability to efficiently meet growing peak-load demands. Currently, CL&P's electric load in the Town of Waterford is served from bulk power substations located in New London, East Lyme, and Uncasville. Growing peak demands are straining the capacity of these three substations and they cannot meet future demands without reducing their service area. The addition of a new bulk power substation in the Town of Waterford will create a more reliable system that will serve the growing needs of the Town while alleviating demands on the existing substations.

The Substation would be located in the western portion of CL&P's 5-acre Property, which currently consists of undeveloped land located immediately northeast of the intersection of Oil Mill Road and Waterford Parkway North. The Property was recently divided from a larger 55 ± acre parcel and purchased by CL&P on December 20, 2007, specifically for this Substation project. The Property location is identified on a United States Geological Survey ("USGS") and

aerial photograph provided as Figure A-1 (S*ite Location Map, USGS*) and Figure A-2 (S*ite Location Map, Aerial*), respectively.

Figure A-1: Site Location Map, USGS



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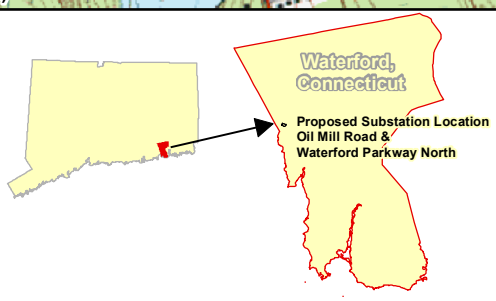

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Figure A-2: Site Location Map, Aerial

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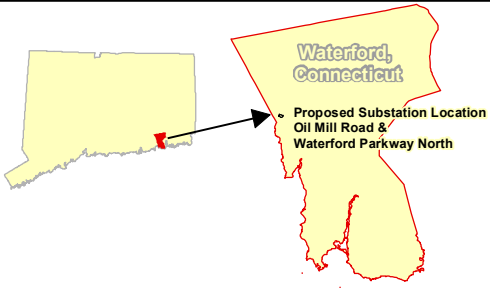

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B. PURPOSE OF THE APPLICATION

CL&P intends to apply to the Connecticut Siting Council ("CSC" or the "Council") for a Certificate of Environmental Compatibility and Public Need ("Certificate") for the Waterford Substation Project (the "Project"). The purpose of the Project is to address a need for additional distribution system capacity and thus improve reliability in the Town of Waterford by establishing a new, strategically positioned bulk power source in the Town.

C. STATUTORY AUTHORITY FOR APPLICATION

Pursuant to the Public Utility Environmental Standards Act, Conn. Gen. Stat. § 16-50g et seq., CL&P has an obligation to consult with all municipalities in which the primary or alternative plans for a substation facility are proposed and all municipalities within 2,500 feet of the proposed Substation. The Substation is proposed to be located on the Property in the Town of Waterford; the eastern boundary of the Town of East Lyme is located within approximately 1,000 feet of the Property.

Specifically, Conn. Gen. Stat. § 16-50*l*(e) requires that:

> … at least sixty days prior to the filing of an application with the council, the applicant shall consult with the municipality in which the facility may be located and with any other municipality required to be served with a copy of the application under subdivision (1) of subsection (b) of this section concerning the proposed and alternative site locations of the facility…. Such consultation with the municipality shall include, but not be limited to good faith efforts to meet with the chief elected official of the municipality. At the time of the consultation, the applicant shall provide the chief elected official with any technical reports concerning the public need, the site selection process and the environmental effects of the proposed facility.

This Municipal Consultation Filing ("MCF") provides information and technical reports concerning the need, site selection process, and potential environmental effects of the Waterford Substation, as required by Conn. Gen. Stat. § 16-50*l*(e). The MCF process is designed to solicit public input to CL&P's development of an application for a Certificate from the CSC. The MCF is a key initial step in the CSC's comprehensive regulatory process that governs the siting of a substation. The goals of this municipal consultation process are to:

- Provide information about the Waterford Substation to the Town of Waterford and the Town of East Lyme; and,

- Obtain input and feedback from these Towns concerning the Substation.

The public can obtain information about the Waterford Substation at the Town Hall offices in both towns and the Waterford and East Lyme Public Libraries.

C.1 Municipal Participation During The Consultation Process

On many occasions over the past twelve months, CL&P has consulted with Town of Waterford officials, including the Planning Director, Thomas Wagner, regarding the electric service provided by CL&P to the Waterford community and CL&P's desire to improve the reliability of that service. CL&P officials also met with the Chief Elected Official of the Town of Waterford, First Selectman Daniel M. Steward on January 23, 2008. Based on the Town's growing need for additional capacity, CL&P determined that a new substation would be required in Waterford. After evaluating several sites, CL&P considers the Waterford Parkway North Property to be the best location for a new substation.

As part of the State review process, Connecticut law provides a mechanism for input by certain town land use agencies on electric substation locations. Specifically, Conn. Gen. Stat. §16-50x(d) permits zoning commissions and inland wetland commissions to "regulate and restrict the proposed location" of such public utility facilities. CL&P filed "Location Review" submissions with the Waterford Conservation Commission on February 11, 2008 and the Planning and Zoning Commission (the "P&Z") on February 21, 2008.

At its regular meeting on February 14, 2008, CL&P gave a presentation to the Conservation Commission. The Conservation Commission issued comments, which have been addressed by CL&P. CL&P similarly presented the Project to the P&Z on February 25, 2008. At its March 10, 2008 meeting, the P&Z issued its findings. Copies of the letters from each of these commissions are included as Appendix A.

Conn. Gen. Stat. § 16-50*l*(e) requires a proponent to file an MCF with the affected municipality and outlines the duties and responsibilities of a municipality during the consultation period preceding the filing of an application for a Certificate by the proponent with the Council. Under § 16-50*l*(e), once the applicant submits the MCF:

> [t]he municipality may conduct public hearings and meetings as it deems necessary for it to advise the applicant of its recommendations concerning the proposed facility. Within sixty days of the initial consultation, the municipality shall issue its recommendations to the applicant. No later than fifteen days after submitting an application to the council, the applicant shall provide to the council all materials provided to the municipality and a summary of the consultations with the municipality including all recommendations issued by the municipality.

CL&P is submitting this MCF for review and comment by the Town of Waterford and the Town of East Lyme. The filing of the MCF with the Chief Elected Official of each municipality begins the required 60-day review process by that municipality. During the municipal consultation process, CL&P is seeking additional comments from representatives of the municipalities and from the interested public for consideration; any such comments will be addressed in the CSC review process. This approach provides an opportunity for CL&P to address municipal concerns prior to submitting the formal application to the Council.

C.2 Description of Filing Contents

This filing presents information concerning the Applicant, conditions at the Property and the proposed Substation, including:

- its location and design;
- the various alternatives considered to date and the process by which the proposed site was identified;
- the need for its construction and operation; and,
- its potential effects on the environment.

D. LEGAL NAME AND ADDRESS OF APPLICANT

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107 Selden Street
Berlin, CT 06037

Mailing Address:

CL&P
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Hartford, CT 06141-0270
Telephone: (860) 665-5000

Internet Address: Northeast Utilities Transmission website
www.transmission-nu.com

E. APPLICANT CONTACTS

Correspondence and other communications with regard to the Waterford Substation should be addressed to, and notices, orders and other papers should be served upon, the following:

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F. DESCRIPTION OF FACILITY

The CL&P Property on which the Waterford Substation would be located was acquired in 2007 for the purpose of building a bulk power substation. Historically, the Property has been undeveloped. Because of its size, configuration, location and proximity to existing electrical transmission infrastructure, the Property was identified by CL&P as an ideal location for a substation site to address anticipated area load growth and current limitations of the existing local distribution system.

The Substation would be accessible from Waterford Parkway North and would be located to the southeast of the existing overhead transmission line corridor. Two 115-kV circuits (#1605 and #1500) exist within this corridor. (see Figure F-1, *Substation Location*). The Substation would occupy an area measuring approximately 200 feet by 245 feet to be covered with a trap rock surface and secured by a seven-foot high chain link fence topped with one foot of barbed wire (three strands). A gravel driveway will be established to provide access from Waterford Parkway North. The Property will accommodate the construction and operation of the Substation without the need to purchase any additional real estate.

Once constructed, the Substation would connect into one (1605 circuit) of the two (1605 and 1500 circuits) existing 115-kV overhead transmission line circuits which now interconnect with the Montville[1] Substation in Montville, with the Williams Street Substation in New London and the Flanders Substation in East Lyme. This 1605 transmission circuit is the southernmost of

[1] Uncasville Substation supplies distribution load to the northern section of the Town of Waterford. The Montville Substation is a transmission-only facility with no distribution circuits. The new Waterford Substation will tap off the existing 1605 transmission circuit between Cohanzie Junction and Flanders Substation. Since the relaying associated with the 1605 circuit will be affected by the Project, transmission-related work at Montville Substation (in addition to Flanders and Williams Substations) is required. The two transmission circuits that supply Uncasville Substation will not be affected by the Project and therefore no associated transmission work at Uncasville is necessary.

the two transmission circuits on the existing right-of-way ("ROW"), which crosses the northwest corner of the Property.

The existing 1605 circuit and adjacent 1500 circuit are supported by common steel poles. Two additional single-circuit steel poles will be installed in order to provide a means for the 1605 transmission circuit to be connected to the Substation.

Figure F-1: Substation Location

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One steel pole will be installed in the existing ROW and one steel pole will be installed in the northwest corner of the Property. The new steel poles will be free standing (no guy wires required) and supported on reinforced concrete foundations. A 115-kV circuit breaker will be installed in the Substation bus to separate the existing 1605 circuit into two circuits: one will retain the 1605 circuit designation and the other will be designated circuit 1617.

The 115-kV interconnections between the Substation and the new transmission line poles would be accomplished by installing two new line-terminal structures within the Substation, each of which would also support a line-disconnect switch. The Substation would also be outfitted with one circuit breaker with associated disconnect switches, two transmission line circuit switchers, two 60-MVA power transformers to step down the voltage from 115 kV to 23 kV, four transformer disconnect switches and three transformer circuit switchers. A transformer disconnect switch and circuit switcher will be in the supply path to each of the two 60-MVA power transformers. The third transformer disconnect would provide for a future 60-MVA power transformer, if needed. An additional transformer disconnect switch and circuit switcher could be used for a mobile transformer connection, when necessary to perform maintenance or to replace a failed transformer. Two metal-clad switchgear enclosures, each approximately 27-feet long, 14-feet wide and 14-feet high will be installed to provide the switching equipment for seven 23-kV distribution feeders, of which four will be activated initially. Cables for each distribution feeder will exit the Substation via underground conduits, rise above ground on wood poles, and connect to three existing overhead distribution feeders near the Substation and one new distribution feeder. All four of these initial feeders from the Substation will follow the general route of the driveway to Waterford Parkway North.

In addition to the switchgear enclosures, a protective relay and control equipment enclosure, approximately 48-feet long by 14-feet wide by 14-feet high, (the "Control Enclosure") and a battery enclosure, approximately 24-feet long by 14-feet wide by 14-feet high, will be installed in the southwest corner of the Substation. The battery enclosure will house the Substation battery and charger. The Control Enclosure will house protective relaying and control equipment and transmission equipment used to operate the Substation. Water and sewer facilities are currently planned to serve the Control Enclosure. Technical specifications and related information are presented in Appendix B (*Site Plan Drawings*).

Development of the Substation requires protective relay system changes within the control enclosures at three other existing bulk substations -Montville, Williams Street, and Flanders. These upgrades are required for the safe and proper operation of the proposed Waterford Substation.

F.1 Estimated Cost of the Waterford Substation

The estimated costs for the siting, design, and construction of the Substation and supporting infrastructure is approximately $11,800,000.

F.2 Facility Service Life

The Substation equipment and supporting infrastructure would have a service life of approximately 40 years and would be capable of capacity increases during this time.

G. NEED FOR FACILITY

The purpose of the Project is to increase electric distribution-system capacity and improve reliability in Waterford by establishing a new, strategically positioned bulk power substation source in the Town of Waterford.

Currently, the electric load in the Town of Waterford is supplied by three bulk power substations in neighboring towns: Flanders Substation located in East Lyme, Williams Street Substation located in New London and Uncasville Substation located in Montville. Flanders Substation, which provides most of the power to Waterford, exceeded its summer peak rating (75 MVA) in August of 2006. CL&P continues to experience load growth in the area requiring additional distribution system capacity. The Williams Street Substation is expected to reach its summer peak rating of 69 MVA in 2009. Uncasville Substation is expected to reach its summer peak rating of 38 MVA in 2013. Figure G-1 depicts the locations of these substations and their respective service areas in Waterford.

The current configuration, which relies on the sharing of Waterford's load with substations in other towns, is not a viable long-term option to meet growing peak-load demands in the Town of Waterford. Development of the Waterford Substation would effectively alleviate loads on the other three existing area substations by adding a new capacity source to the distribution system in the area. The addition of the Waterford Substation to the distribution system, and the resultant load redistribution in Waterford, is graphically depicted in Figure G-2.

Figure G-1: Existing Waterford Area Substation System

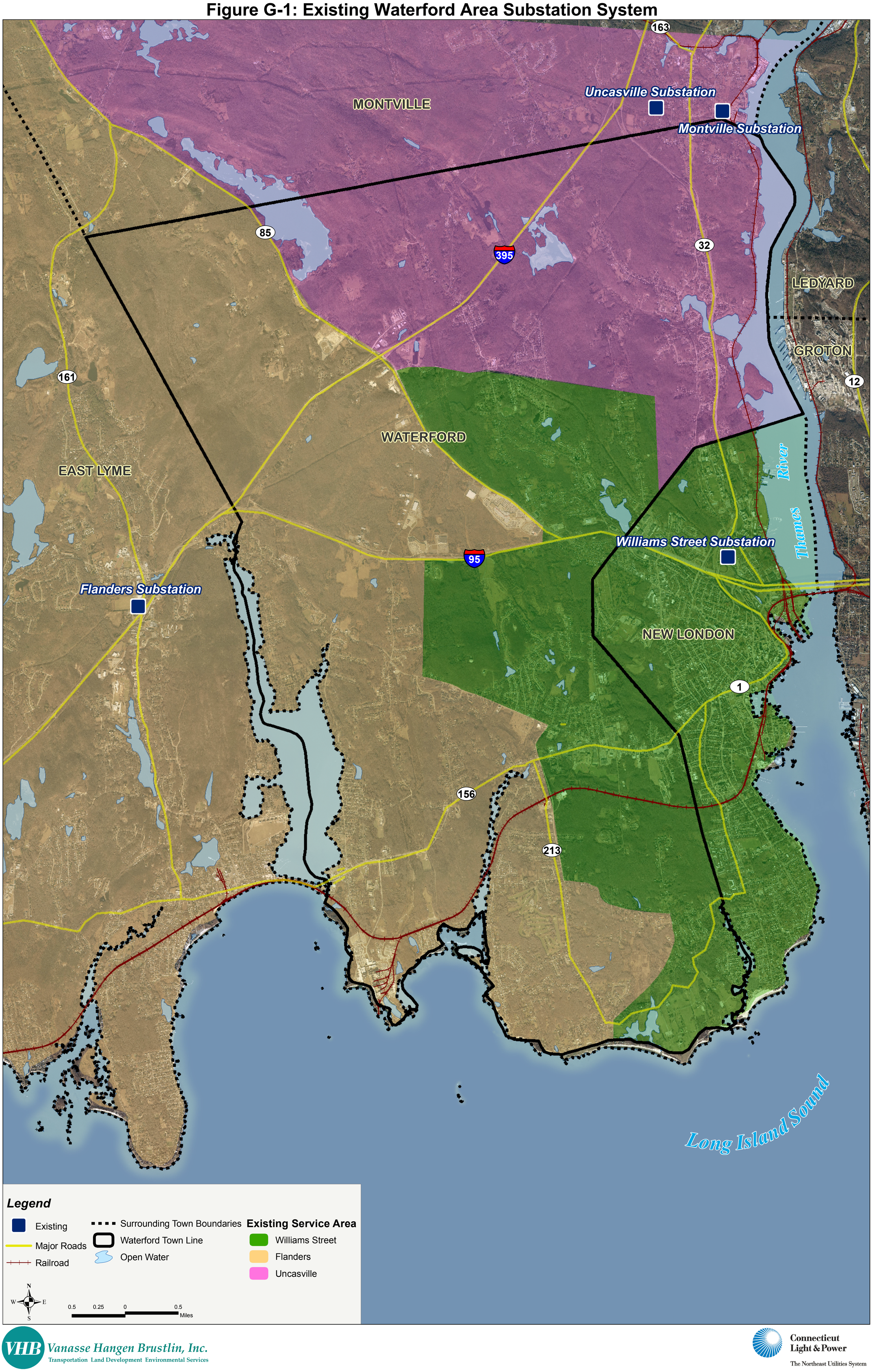
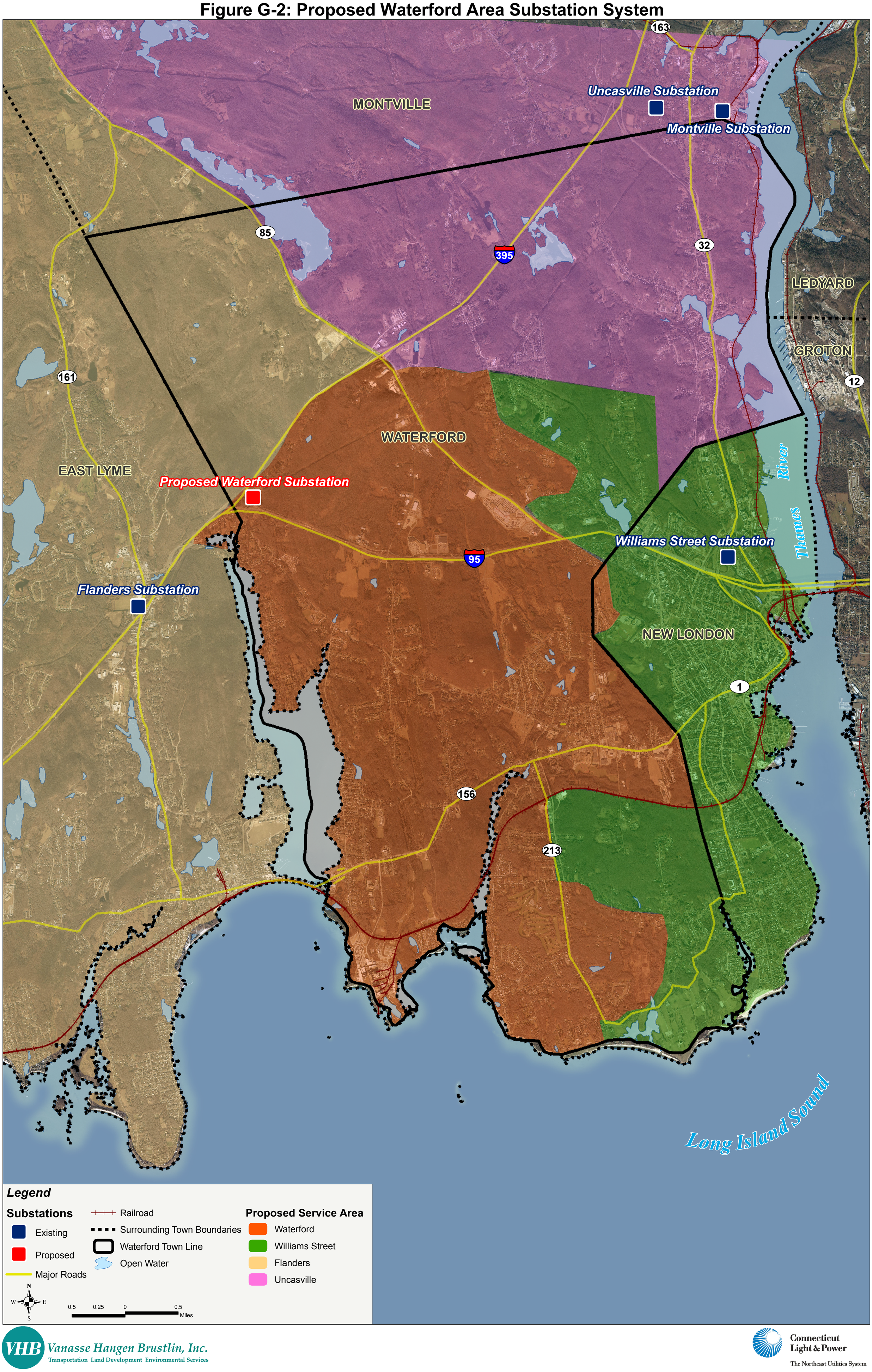


Figure G-2: Proposed Waterford Area Substation System



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G.1 System Alternatives

CL&P considered alternative system options to meet the challenges in Waterford. However, the available options evaluated would not produce a distribution system that is as reliable and flexible as the system that will result from the proposed Project and, ultimately, would not eliminate the need for the proposed facility to meet system capacity projections. The Waterford Substation was found to be the preferred solution based, in part, on the following:

- Proximity to customer load,
- Improved reliability with decreased feeder length, and
- Improved reliability for load transfers during feeder outages.

Alternative system options that were considered are discussed below:

Flanders Substation

Option 1: Replace existing transformers with higher capacity transformers.

Replacement of the two existing 47 MVA power transformers at this substation with larger 60 MVA power transformers was evaluated. The transformer replacement would potentially increase the capacity from its current rating of 75MVA to 91MVA. This capacity is expected to be exceeded in 2016 with forced load transfers. The transformer replacement would not alleviate the long term problem of increased load in the area. Therefore, the option to replace the existing transformers was rejected.

Option 2: Add third transformer at Flanders Substation.

Flanders Substation is a small facility (approximately 288 feet by 118 feet in size) and has an outdated open bus style configuration. The Substation at present is built out and there is no space to add the third transformer and make associated improvements to the Substation yard.

Extending additional circuits from Flanders Substation to the Town of Waterford would present substantial technical challenges. The Niantic River is located between the Flanders Substation and the Town of Waterford. The existing crossing at Niantic River has three circuits installed on a single pole and cannot support additional circuits. A new crossing would require installation of new support infrastructure and disturb the area surrounding the Niantic River. As a result, this option is not favored.

Williams Street Substation

Construction of the Waterford Substation along with the installation of a new distribution feeder will alleviate the loads at Williams Street Substation, thereby pushing out the overloaded conditions on the existing facility to 2030 from the presently projected timeframe of 2008.

CL&P evaluated the replacement of the existing power transformers at Williams Street Substation with larger transformers as well as the installation of a third transformer. However, there are limitations associated with the feeder circuits that would be necessary for supplying additional power. Present feeder circuits from the Williams Street Substation supplying the Town of Waterford and New London are at their capacity limits under peak load. Additional feeder circuits would require new duct bank and new ROW acquisition. Based on these constraints, this option was ultimately rejected.

Uncasville Substation

Uncasville Substation is located six miles away from the load center that is proposed to be served by the Waterford Substation. Bringing new circuits from Uncasville to Waterford would present both technical and physical challenges. The proximity of the supply to the load center is one of the critical criteria of siting a viable substation. Uncasville Substation's distance

from the load center makes this option less than desirable. Uncasville at present is projected to overload in year 2013.

Additionally, the distribution voltage supplied to Uncasville (13.8 kV) is different than that of Flanders Substation (23 kV). This mismatch would compromise the reliability of the area.

H. EXISTING CONDITIONS

An *Existing Conditions Map*, depicting current conditions on the Property, its access, abutting properties, and several key features discussed herein, is provided as Figure H-1. The purpose of this section is to describe current conditions on the Property. A detailed discussion of the Waterford Substation's effects on the environment is provided in Section K of this document.

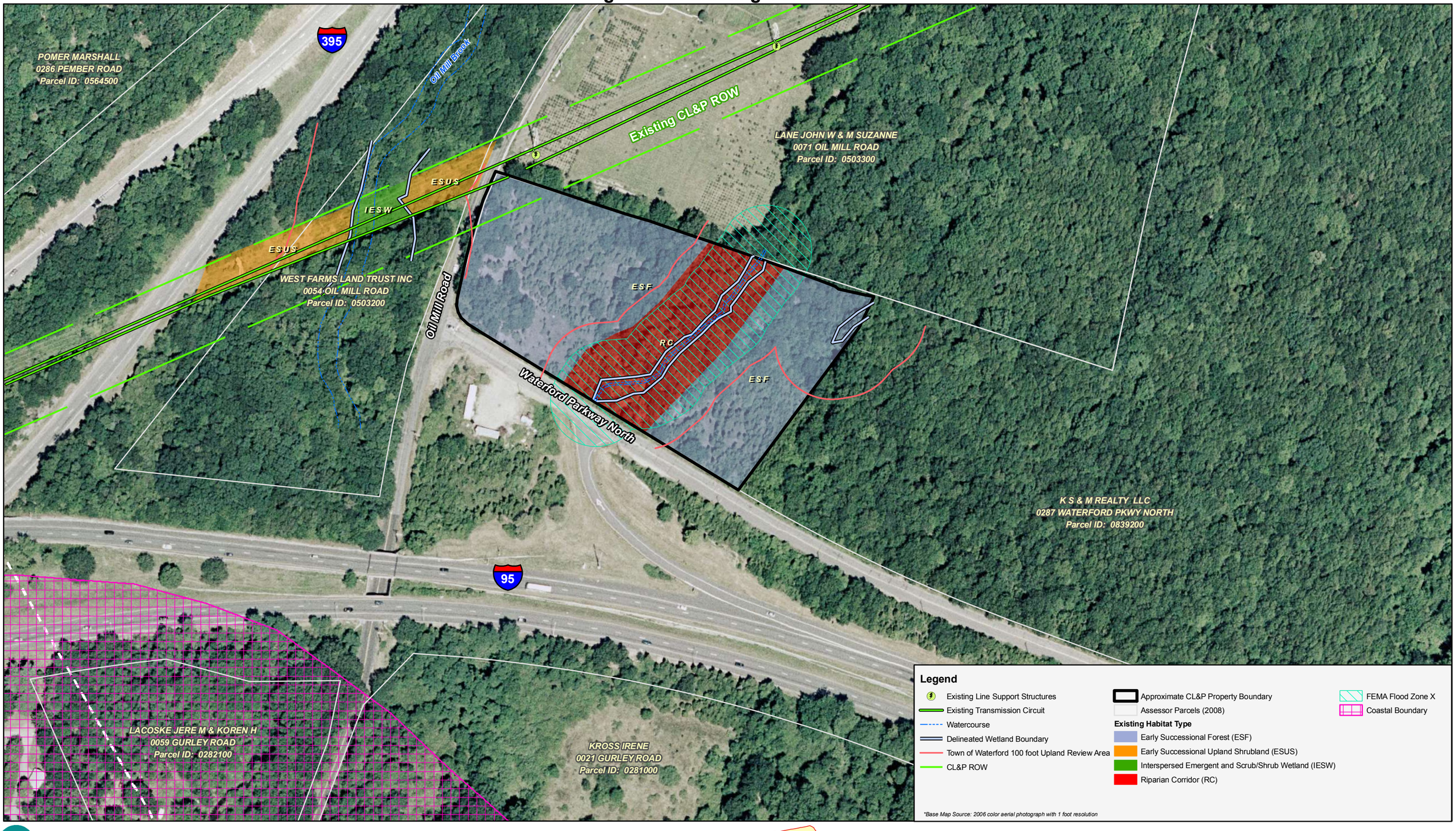
H.1. Existing Development

The undeveloped Property encompasses approximately 5 acres. The Property was recently divided from a larger 55 ± acre parcel identified by the Waterford Assessor's Office on Map 88, as Lot 287. A new lot number has not yet been determined but the Property has been assigned an address of 325 Waterford Parkway North. The 5-acre Property was purchased by CL&P on December 20, 2007 specifically for this Substation project.

According to the Tax Assessor's field cards, the Property is zoned "RU-120", which is defined by the Town of Waterford as a "Rural Residential District." The Site currently exists as undeveloped land and is covered with moderate tree growth, with some small clearings and limited growth in its central portion.

Existing on-site topography can be characterized as generally flat at 50 feet above mean sea level with a slight upward slope to the east and northeast. An unnamed stream and associated wetland corridor are present running north to south in the east-central portion of the Property.

Figure H-1: Existing Conditions



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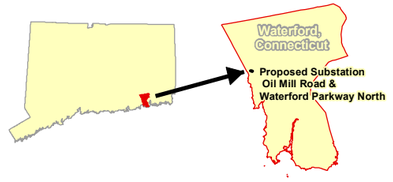

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Surrounding land use in the vicinity of the Site consists of a highway, residential and undeveloped properties. The Site is abutted to the south (across Waterford Parkway North) by Interstate 95; to the north by an existing transmission line corridor, a tree farm and residence; to the east by undeveloped land; and, to the west (across Oil Mill Road) by undeveloped land. An exit ramp from I-95 south accessing Waterford Parkway North immediately to the southeast is located across from the Site. Figure H-2 (*Nearest Residences*) depicts the locations and distances of surrounding residences to the Substation.

Several alternate site locations along the transmission line corridor were evaluated for development of this Project (see Section I, *Alternatives Sites Evaluated*, of this MCF). For the following reasons, the Property is well suited for the proposed Substation:

- An existing 115-kV transmission line currently exists immediately north of the Property;
- There are optimal interconnection opportunities to existing 23-kV distribution feeders along Oil Mill Road and Waterford Parkway North;
- The Property has direct access from a local road; and,
- Construction can be completed and the Substation can be operated with minimal effects on the surrounding environment.

H.2. Site Access

The Site has frontage along both Waterford Parkway North and Oil Mill Road. However, no improved driveway currently exists.

Figure H-2: Nearest Residences

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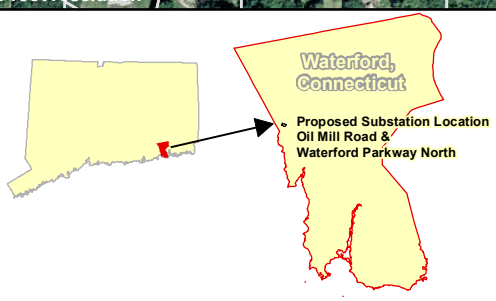

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H.3. Wetlands and Watercourses

Wetlands were delineated by a Registered Soil Scientist at Vanasse Hangen Brustlin, Inc. on September 14, 2007. Details of the wetland delineation are within the *Wetlands Delineation Report* provided in Appendix C.

A Riverine Upper Perennial wetland system (Wetland 1) transects the Site from northeast to southwest. This system consists of a perennial stream (WC 1-01X to 1-11 and WC 1-23 to 1-31) with associated bordering wetlands (WF 1-12 to 1-22). The stream flows through the Site within a well defined, possibly excavated, channel. At its southern extent the channel becomes less defined and bordering wetlands exist. The stream exits the property beneath Waterford Parkway North via a culvert. This stream functions as a discharge (or gaining stream) in its upper reaches then transitions to a recharge (losing stream) as it enters outwash deposits located on the Property. Dominant vegetation within this system includes white ash *(Fraxinus Americana)*, red maple (*Acer rubrum)*, sweet pepperbush *(Clethra alnifolia)*, spicebush *(Lindera benzoin)*, winterberry *(Ilex verticillata)* and New York fern *(Thelypteris noveboracensis)*.

A Palustrine Forested wetland system (Wetland 2; WF 2-01 to 2-07) exists within the eastern Site boundary. This wetland, a small shallow depressional system, is the westernmost portion of a larger wetland system that extends off-site immediately east of the northeast corner of the Property. Dominant vegetation in this wetland area includes black birch *(Betula lenta)*, red cedar *(Juniperus virginiana)* and New York Fern.

There are no tidal wetland areas involved with this Project.

H.4. Vegetation and Wildlife

The Site contains two general habitat types. These habitat types are closely related to previous land uses as well as the soil types found on site. Soils on the Site are derived from glacial outwash and consist primarily of sand and gravel. The eastern and western portions of the Site are characterized as old field or early successional forest. Level topography, species composition, infertile soils and evidence of historic access to these areas from Waterford Parkway North are evidence of past agricultural uses as well as possible sand and gravel excavation. Eastern red cedar occurs in virtually pure stands in these two areas, increasing in density on the east side of the Property. Where scattered hardwoods exist within this habitat type, species such as scarlet and black oak are further evidence of a relatively infertile substrate. In areas where the tree canopy is open, a more developed herbaceous layer exists. Species observed such as little bluestem, poverty grass, and pineweed are indicative of dry infertile sites. The location(s) of the vegetative communities on the Property are illustrated in Figure H-1 (*Existing Conditions Map*).

H.5. Rare, Threatened, and Endangered Species

CL&P reviewed the CTDEP's Natural Diversity Database (updated December 2007), which identifies general areas of concern with regard to state and federally listed Endangered, Threatened, and Special Concern species and significant natural communities. No areas of concern with regard to threatened or endangered species and/or significant natural communities were identified at or in the vicinity of the Site.

H.6. Water Supply Areas

Groundwater below and near the Property is classified by the CTDEP as a GA groundwater area. The GA classification indicates groundwater within the area of existing private water supply wells or an area with the potential to provide water to public or private water supply wells. CTDEP presumes that groundwater in such an area is, at a minimum, suitable for drinking or other domestic uses without treatment.

There are no public water supply wells within a 2-mile radius of the Site. The closest public water supply well is part of the Gorton's Pond Wellfield (a State- designated Preliminary Aquifer Protection Area), located approximately 2.12 miles south of the proposed Substation. The Property is not located within this or any other Aquifer Protection Area.

H.7. Scenic Areas

Based on information provided by the Town of Waterford's Planning and Zoning Office, there are no State or locally designated scenic roads or Natural Scenic Resources in the Town.

H.8. Historic and Archaeological Resources

Environmental characteristics frequently are used to predict the location of archaeological sites. Typically distance to water, slope, and soil types are included as part of these predictive models. A review of environmental characteristics identified in the vicinity of the proposed project area suggests that this location may once have been highly favorable to past human settlement and land use. In particular, the proposed project parcel appears to be situated on a gently sloping topography near the headwaters of the Niantic River. Further, a review of previously recorded cultural resources on file with the Connecticut State Historic Preservation Office (SHPO) demonstrates that the proposed project area is situated in the vicinity of several

previously identified cultural resources. This file review revealed that there are six historic and four prehistoric, previously identified archaeological sites situated within 0.5 mile of the Site. None of these previously identified cultural resources are situated within or immediately adjacent to the Site. Finally, there is no record indicating that the Site has been subjected to a cultural resources survey in the past.

Historically, the Site is situated on a landscape that was characterized primarily as rural and agrarian during the nineteenth through mid-twentieth century. Despite development in the areas surrounding the Site, such as highway- and utility-related construction, the project parcel remained a wooded lot. Based on available mapping and cultural resources data, as well as relevant aerial imagery, it appears that the area encompassing the Site has been only minimally (if at all) impacted by historic and modern occupation and land use. Pedestrian survey and photo-documentation of the Site confirmed this interpretation. At the time of the survey, the Site was described as a wooded lot with limited areas of disturbance noted along the bounding roadways (i.e., to the south by Waterford Parkway North and to the west by Oil Mill Road).

CL&P submitted a request for determination from the SHPO regarding the potential effect or no effect of the Project on cultural resources on January 15, 2008. The SHPO responded in writing on January 17, 2008 that the project boundaries possess moderate to high archaeological sensitivity and requested that further investigation be undertaken. *SHPO Correspondence* is provided in Appendix D. The results of these investigations are provided in Section K-8 of this MCF.

H.9. Natural Resources

Site bedrock and surficial geology was determined by reviewing the Environmental GIS Data for Connecticut 2003 Edition compiled by the CTDEP. Bedrock geology underlying the majority of the Property is mapped as the Tatnic Hill Formation, a gray to dark gray, medium grained gneiss or schist. No bedrock outcroppings are visibly apparent on the Site. Surficial soils at the Property are mapped as an alluvium, classified as Prime Farmland Soils and described as an Agawam fine sandy loam, 3 to 8 percent slopes.

H.10. Floodplain Areas

According to the Flood Insurance Rate Maps for the Site (Community Panel Numbers 090107 0005D and 0010C), the unnamed stream located east of the proposed development area is not associated with a Special Flood Hazard Area or Floodway. The stream is classified by Other Flood Areas as Zone X. Zone X includes areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

H.11. Recreational Areas

There are no recreational areas directly abutting or within one mile of the Property. The nearest recreational area is Oswegatchie School playground located approximately 1.34 mile southeast of the Property.

H.12. Seismic Areas

The USGS-National Earthquake Reduction Program has developed a series of maps that depict the estimated probability that certain levels of ground shaking from an earthquake will

occur within a given period of time. USGS takes into account the seismic history of an area and the expected decrease in intensity with distance from the epicenter. Based on a review of USGS-National Earthquake Reduction Program maps and information obtained by the Weston Observatory (a geophysical research laboratory), there are no seismic areas located at the Property or within its immediate area.

H.13. Noise

Because the Property is undeveloped, existing noise levels emanating from the Property are below those established for residential areas by the CTDEP's noise control regulations (RCSA Title 22a, §22a-69-1 to 22a-69-7.4). Contributing factors for noise generation in the area are traffic noises generated from Interstate 95 and the surrounding local road system.

H.14. Lighting

Currently, there are no lighting facilities present on the Property.

H.15. Coastal Zone Management Areas

As defined in Conn. Gen. Stat. § 22a-94(a), the Connecticut Coastal Area includes the land and water within numerous towns, including the Town of Waterford. A subset of the Coastal Area, called the Coastal Boundary, represents an area within which activities regulated or conducted by coastal municipalities must be consistent with the Coastal Management Act.

The Property is located approximately 660 feet outside and north of the Coastal Boundary.

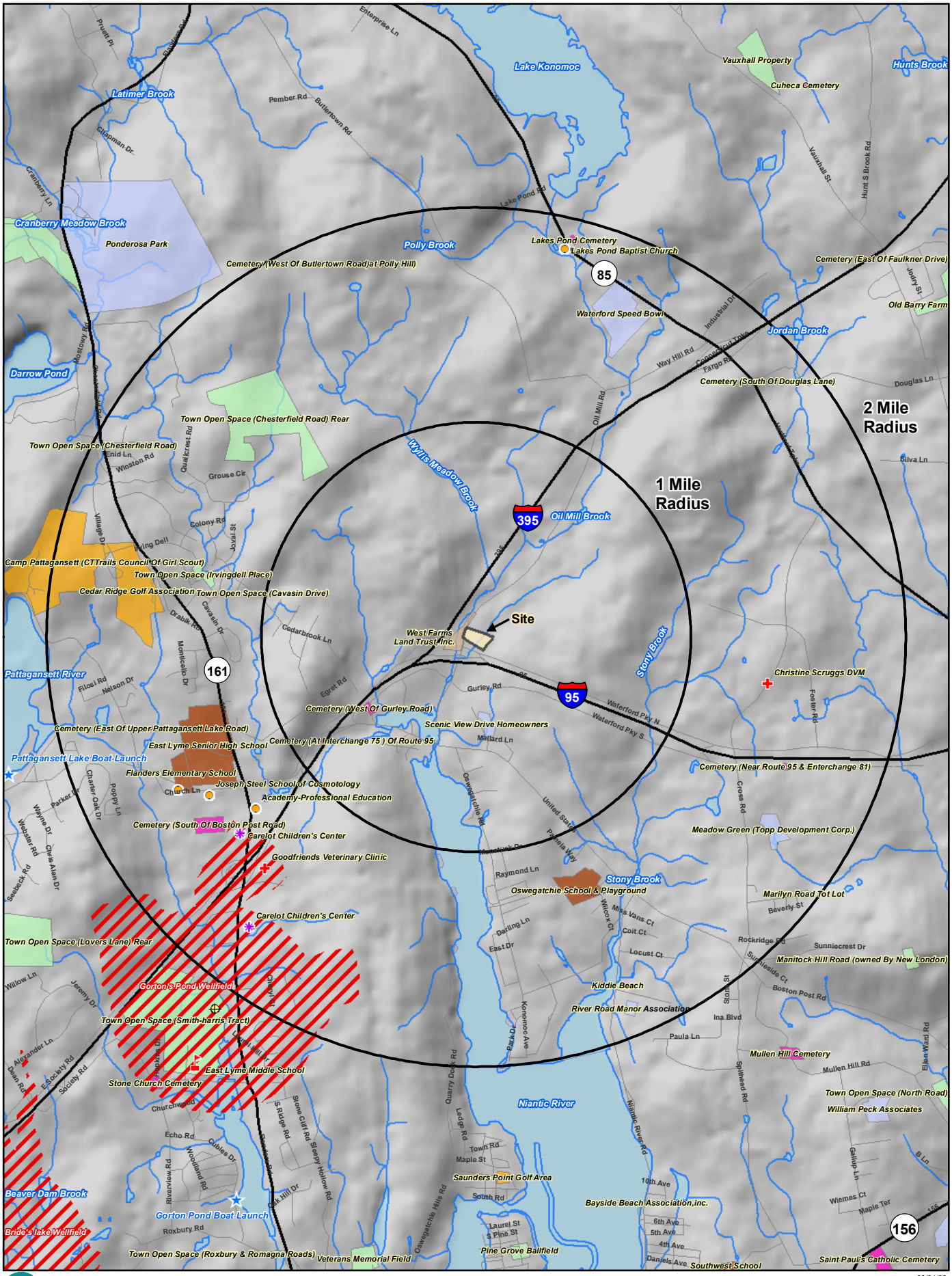
H.16. Other Surrounding Features

Table H-1 lists non-residential features within two miles of the Property. Figure H-3 (*Surrounding Features*) depicts the nearest locations of non-residential development.

TABLE H-1: Surrounding Non-Residential Features Within Two Miles of the Property

Name	**Address**	**Location from Property**
Schools		
East Lyme High School	30 Chesterfield Road, East Lyme	1.30 miles southeast
Oswegatchie Elementary School	470 Boston Post Road, Waterford	1.34 miles southeast
Academy Professional Education	339 Flanders Road, East Lyme	1.45 miles southwest
Joseph Steel School of Cosmetology	144 Boston Post Road, East Lyme	1.50 miles southeast
East Lyme Special Education	165 Boston Post Road, East Lyme	1.61 miles southeast
Flanders Elementary School	167 Boston Post Road, East Lyme	1.61 miles southeast
Lakes Pond Baptist Church	1144 Hartford Tpke., Waterford	1.75 miles northeast
Daycares		
Carelot Children's Center	315 Flanders Road, East Lyme	1.51 miles southwest
Carelot Children's Center	245 Flanders Road, Niantic	1.81 miles southwest
Playgrounds		
Oswegatchie School	470 Boston Post Road, Waterford	1.34 miles southeast
Hospitals		
Christine Scruggs, DVM	122 Cross Road, Waterford	1.42 miles east
Goodfriends Children's Center	339 Flanders Road, #104, Waterford	1.81 miles southwest
Parks/Beaches		
Kiddie Beach	Niantic River Road, Waterford	1.71 miles southeast
Group Homes		none identified within two miles
Licensed Youth Camps		none identified within two miles
Hunting or wildlife management areas		none within two miles
Settled and Residential areas		Within 0.5 mile north and south

Figure H-3: Surrounding Features



Legend:

- CL&P Property Boundary
- Boat Launch Areas
- Aquifer Protection Well
- Aquifer Protection Area

Points of Interest

- School
- Daycare
- Hospital
- Group Home
- Other

CTDEP Municipal Property

- School
- Cemetery
- General Recreation

- Existing Preserved Open Space
- Preservation
- Uncategorized
- Water Bodies

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Transportation Land Development Environmental Services

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I. ALTERNATIVE SITES EVALUATED

CL&P identified an area in Waterford, Connecticut where additional bulk substation capacity is needed (i.e., the "load pocket"). At present the Town is supplied power from three substations in other towns. There are technical limitations to increasing capacity at these facilities as discussed in Section G-1. The most viable solution to address this need is the establishment of a new bulk power substation in Waterford. The ideal location for this Substation provides: proximity to an existing 115-kV transmission circuit; proximity to the distribution load pocket; and, accessibility to and from a public road. Locating the facility near an existing 115-kV transmission circuit avoids new transmission line construction and ROW acquisitions. A site centrally located within the load pocket would minimize distribution circuit lengths and enhance contingency tie capabilities with distribution circuits emanating from adjacent substations. Additionally, direct access to the Substation site is important to reduce overall environment impacts along the transmission line corridor. Based on these considerations, a site search area was defined and six potential sites were identified.

Undeveloped or vacated properties in the search area generally greater than two acres in size and generally square in shape, which satisfied the parameters discussed above, were initially selected as potential sites. For this Substation, sites of this size would typically provide suitable buffer to surrounding properties. Land that is currently developed and being utilized is typically excluded, unless the property is intended to be sold. Industrially-zoned sites meeting the same parameters are preferred over non-industrial sites. In this case, the transmission circuits and load pocket are located predominantly within non-industrial areas.

Six potentially viable site locations in Waterford were identified and evaluated, using the following major criteria, to determine the most suitable location for construction of this new Substation*:*

- Proximity to distribution load pocket and existing feeders
- Proximity to existing transmission electrical circuits
- Ease of access
- Earthwork requirements
- Sufficient size and shape
- Zoning and land-use constraints
- Wildlife and habitat
- Wetlands, vernal pools, watercourses and floodplains
- Proximity to public water supply watershed and/or aquifer areas

The Waterford Parkway North Property best satisfied the criteria and is therefore the most feasible location. A summary of the potential site locations is provided below.

Location #1, 325 Waterford Parkway North (the Property) - This Property provides excellent connections to three existing 23-kV distribution circuits serving the area. A substation located on this site can be easily connected to an existing 115-kV transmission circuit. The Property is of sufficient size to install the proposed substation facilities without impacting the wetland system in the east-central portion of the Property.

Location #2, 994 Route 85 Hartford Turnpike - This site provides limited connection possibilities to existing 23-kV distribution circuits serving the load pocket, therefore requiring extensive distribution line work in the area. A substation located at this site can be connected to an existing 115-kV transmission circuit. The Property is of sufficient size to install the proposed substation facilities; limited adjacent land-use and wetland constraints exist.

Location #3, southeast of # 969 Petroleum Station-Route 85 Hartford Turnpike - This site provides limited connection possibilities to existing 23-kV distribution circuits serving the load pocket, therefore requiring extensive distribution line work in the area. A substation located at this site would require substantial earth work, due to the topography.

Location #4, north of 813 Vauxhall Street (Cohanzie Junction) - This site is farther away from the existing load pocket, and poor connection possibilities to existing 23-kV distribution circuits exist, resulting in the need for extensive distribution line work to connect to the 23-kV circuits. A substation located at this site can be easily connected to an existing 115-kV transmission circuit. The site is located within close proximity to surrounding residential homes with minimal substation buffer areas.

Location #5, northwest of 130 Old Colchester Road - This site provides poor connection possibilities to existing 23-kV distribution circuits serving the load pocket, therefore requiring extensive distribution line work to get to the 23-kV circuits. A substation located on this site can be easily connected to an existing 115-kV transmission circuit, but significant surrounding land-use constraints exist.

Location #6, north of Bloomingdale Road - This site is farther away from the existing load pocket, and poor connection possibilities to existing 23-kV distribution circuits exist, resulting in extensive distribution line work to connect to the 23-kV circuits. A substation located on this site can be easily connected to an existing 115-kV transmission circuit, but significant surrounding land-use constraints exist.

J. SAFETY AND RELIABILITY INFORMATION

The Project would be constructed in full compliance with the standards of the National Electrical Safety Code, the Connecticut Department of Public Utility Control, and good utility practice. In the event that an energized line or substation equipment fails, protective relaying equipment would immediately remove the equipment from service, thereby protecting the public and the remaining equipment within the Substation.

The Waterford Substation would be equipped with measures to ensure continued service in the event of outages or faults on transmission or substation equipment. Continued reliability would be achieved by incorporating a "loop through" design configuration for the existing 115-kV overhead transmission line, transformer protection, and redundant automatic protective relaying equipment.

Protective relaying equipment would be provided to automatically detect abnormal system conditions (e.g., a faulted overhead transmission line) and would send a protective trip signal to circuit breakers to isolate the faulted section of the transmission system. The protective relaying schemes would include fully redundant primary and backup equipment so that a failure of one scheme does not require the portion of the system being monitored by the protective relaying equipment to be removed from service.

The protective relaying and associated equipment, along with a Supervisory Control and Data Acquisition ("SCADA") system for remote control and equipment monitoring by the Connecticut Valley Electric Exchange ("CONVEX") System Operator, would be housed in a weatherproof, environmentally-controlled electrical enclosure.

CL&P incorporates IEEE/ANSI and NFPA standards for fire protection in its substation design and operates these facilities to minimize the impact of fire, in case of an unlikely event.

CL&P trains its employees and the local fire department on the safe methods to deal with a substation fire. The control enclosure would be locked and equipped with fire extinguishers, as well as smoke and heat detectors that would be monitored from a remote location. Fire/smoke detection would automatically activate an alarm at CONVEX and the system operators would then take appropriate action.

Additional devices would constantly monitor the Substation to alert CL&P of any abnormal or emergency situations. The perimeter of the Substation would be enclosed by a seven-foot high chain link fence topped with an additional foot of three strands of barbed wire to discourage unauthorized entry and/or vandalism. The Substation entrance would be gated and locked. Lighting would be available within the Substation yard to facilitate work at night or during inclement weather.

CL&P would install sumps to serve as oil-spill containment reservoirs around the proposed transformers. The sumps would be sized with sufficient capacity to contain a spill in the event of an inadvertent release of oil. CL&P plans to install an Imbiber Beads Drain Protection System® for the sump, similar to containment systems installed at other CL&P substations, including Shunock Substation in North Stonington.

K. EFFECTS ON THE ENVIRONMENT

The development of the Waterford Substation would not have any significant, long-term adverse effects on the existing environment and ecology, nor would it affect the scenic, historic and recreational values of the vicinity. A *Proposed Conditions Map* is included as Figure K-1.

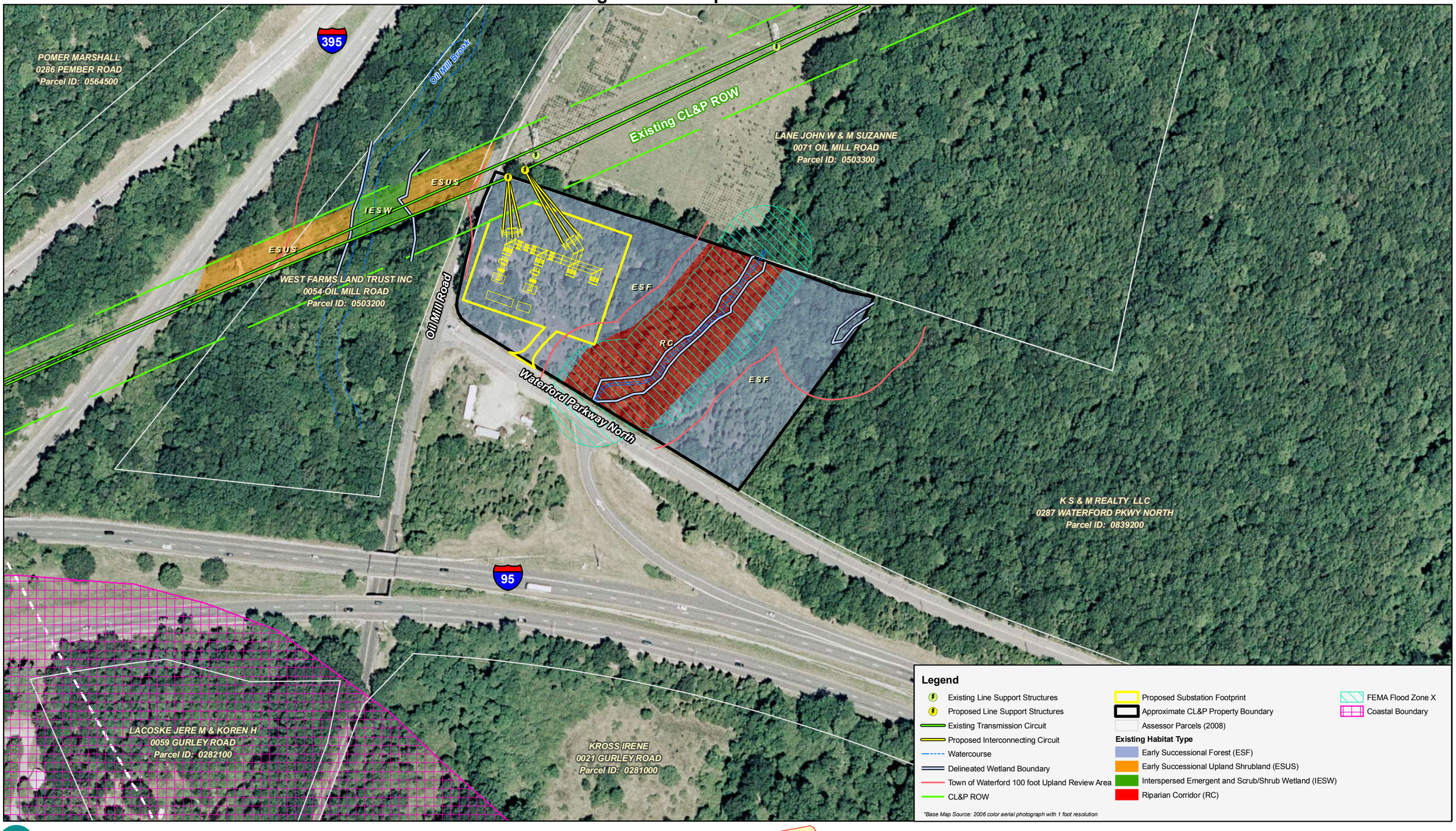
K.1. Public Health and Safety

The Waterford Substation would be designed to applicable CL&P, industry, State, and local codes and standards and would not pose a safety concern or create undue hazard to the general public. The Substation would not consume any raw materials, would not produce any by-products and would be unmanned during normal operating conditions. Applicable signage would be installed alerting the general public of the dangers of high voltage associated with the Substation.

K.2. Local, State and Federal Land Use Plans

The proposed Project is consistent with local, State, and Federal land use plans. Local land use application processes do not specifically apply to the Project. However, the Project has been designed to meet the intent of local land use regulations. CL&P has met with Town officials and provided Location Review submissions to Waterford's Conservation Commission, and Planning and Zoning Commission. These Commissions provided comments which have been addressed by CL&P.

Figure K-1: Proposed Conditions



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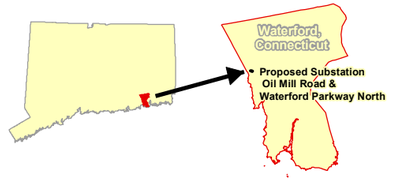

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K.3. Existing and Future Development

The Waterford Substation would benefit the community by improving electrical service for existing development in the Town and surrounding areas, as well as providing additional development through enhanced reliability and the capacity to serve additional load. The Town of Waterford does not currently have its own bulk power substation.

The Substation would be situated immediately south of the existing transmission line corridor, generally in the western portion of the Property. The Substation would be located within an irregularly shaped fenced compound that would encompass a 47,600 ± square foot area (measuring approximately 200 feet by 245 feet at its longest dimensions). Connecting the Substation to the existing 115-kV line requires the installation of one new steel-pole structure within the ROW north of the Property line and one new steel utility structure within the Property boundary.

K.4. Roads

A gravel driveway would be developed to serve as entry/egress from Waterford Parkway North to the Substation. A bituminous concrete apron would be provided at the entrance of the Property at its junction with Waterford Parkway North. This would serve as the only access to the Site once the Substation is operative; no access will be established from Oil Mill Road.

During construction of the Substation, the driveway would be stabilized with stone, and anti-tracking mats would be installed to prevent tracking of soil onto local streets. During construction of the transmission interconnection, the established access to the ROW off Oil Mill Road may also be used.

Upon completion of the Substation, the driveway off Waterford Parkway North would be finished with a gravel base and gated. After construction is completed, approximately three to four vehicular trips per month to the Property would be anticipated for maintenance and inspection activities.

K.5. Wetlands

Construction of the proposed Substation would not result in any effects on wetlands or watercourses. Limited work is anticipated within the 100-foot upland review area of the perennial watercourse and its bordering wetlands located on the Property. Proposed activities within the upland review area include grading and construction of a small 1,241 ± square foot portion of the fenced Substation.

K.6. Wildlife and Vegetation

Construction of the Substation would not have significant adverse effects on vegetation, wildlife or habitat values. The Substation would occupy what is currently early successional upland forest. Sufficient habitat of similar nature (in excess of 50 acres) exists to the east across the intermittent stream. The Project would not have an adverse effect on wildlife due to the Substation footprint's immediate proximity to similar habitats that would allow for natural relocation of potential wildlife from the construction zone. In addition, the adjacent transmission corridor provides valuable and diverse wildlife habitat.

K.6.1. Rare, Threatened, and Endangered Species

No state or federally endangered, threatened or special concern species have been identified on the Property. Based on current CTDEP NDDB review criteria, the proposed Substation project does not present a potential conflict with a listed species or significant natural

community. Further, CL&P submitted a letter request on January 15, 2008 to the CTDEP for concurrence. CL&P received confirmation in writing on January 28, 2008 that no known extant populations of federal or state Endangered, Threatened, and Special Concern species occur at the Property. The *CTDEP Correspondence* is provided in Appendix E.

K.7. Water Supply Areas

The closest public water supply wells are part of the Groton Pond Wellfield (a State-designated Preliminary Regulated Aquifer Protection Area), located approximately 1.3 miles southwest of the Substation. The transformer at the Waterford Substation would contain insulating fluid; however, the equipment would have secondary containment and accidental spill prevention provisions in place. Based on these design considerations and the physical distance of the water supply wells to the Substation, the Project would have no adverse environmental effect on the aquifer.

K.8. Historic and Archaeological Resources

Consultation with the Connecticut SHPO indicated the potential for this property to yield subsurface cultural deposits. At the request of SHPO, a Phase I cultural resources survey was conducted at the Property. Prior to the initiation of subsurface testing, a pre-fieldwork archaeological assessment was completed by reviewing previous archaeological studies and resources recorded in the region, historic maps, and aerial images depicting the Property. Fieldwork for this investigation consisted of pedestrian survey, systematic subsurface testing, mapping, and photo-documentation.

During the Phase I cultural resources reconnaissance survey, 62 shovel test pits were completed on the Property in a grid pattern of points spaced approximately 50 feet apart. In

several instances, mottled soil stratigraphy was encountered indicating the presence of prior disturbances throughout the Property. These disturbances included tree throws, mechanical earth movement, and the excavation of percolation tests. Finally, pedestrian survey of the southwestern corner of the Property revealed the effects of previous gravel operations, which consisted of substantial erosion and the removal of the topsoil in this area.

Fieldwork resulted in the identification of two non-site cultural resources, including a ceramic shard and quartz flake. These items do not constitute evidence of cultural significance. No additional testing of the Property was recommended.

Based on the results of this investigation, the construction of the proposed Substation would not impact any significant cultural resources. CL&P has submitted the Phase I cultural resources reconnaissance survey report to the SHPO for review.

K.9. Noise

Infrequent impulse noise would be generated from switching and circuit breaker opening and closing. The impulse noise levels and steady-state transformer noise levels are not expected to exceed the levels permitted at the Property line by CTDEP's noise control regulations.

The construction and testing of the Substation facilities is expected to occur over a 12- to 15-month period. In general, construction hours would be from 7 am to 5 pm, Monday through Friday. Site preparation, including grading and installation of foundations, would take place during the initial 6 months of construction and involve the use of earth-moving equipment and construction vehicles.

The installation and testing of equipment would take approximately 9 months and would involve the use of cranes to unload and install structural elements and large equipment. The

installation of the 115-kV line and Substation terminal structures, interconnection of the supply lines to the Substation, and connections to the distribution system will occur outside of normal work hours because these activities necessitate taking critical transmission and/or distribution equipment out of service. As a result, this work would be scheduled for off-peak electrical demand hours and coordinated with the Town.

K.10. Floodplains

The Zone X associated with the Site stream is approximately 160 feet wide in total, or 80 feet wide from the stream channel. The southeast corner of the Substation would encroach into the Flood Area Zone X by approximately 5 feet.

K.11. Seismic Areas

As with all substations constructed by CL&P, this Substation will meet or exceed the State Building Code, which includes seismic loading, wind loading, and snow and ice loadings, among others.

K.12. Lighting

The Waterford Substation will have low-level lighting for safety and security purposes. These lights would be recessed or activated manually to minimize visual effects at night. Lighting would not affect existing residences in the vicinity of the Property. Additional lighting capability would exist in the Substation to allow for work at night under abnormal or emergency conditions.

K.13. Natural Resources

No adverse effects are anticipated on natural resources occurring at and/or nearby the Property. Minor earthwork is required to accommodate the Substation at the Site.

K.14. Coastal Zone Management Areas

The Site is located outside of the Coastal Boundary but the Town of Waterford is located within the Coastal Area, as defined by Conn. Gen. Stat. § 22a-94(a). No coastal resources are located on the Property or within the Site vicinity; the Coastal Boundary is located approximately 600 feet south of the Property. The Project would not result in adverse impacts to coastal resources as defined in the Connecticut Coastal Management Act.

K.15. Other Surrounding Features

No adverse effects are anticipated to the facilities depicted on Figure H-3, primarily because of their sufficient distance from the Substation and/or the presence of I-95.

L. MITIGATION MEASURES

Based on the existing conditions at the Property and the proposed design, the construction and operation of the Substation would not have any significant permanent adverse effects on the environment. CL&P has incorporated measures into all phases of Project development and implementation to promote protection of the environment in accordance with Federal, State and local requirements.

L.1 Pre-Construction Considerations

Before any construction activities occur, CL&P would prepare a Development and Management Plan ("D&M Plan"), which must be approved by the CSC. The D&M Plan would include *CL&P's 2005 Construction Best Management Practices*, which are designed to minimize or eliminate potential adverse environmental effects which may result from construction activities. The D&M Plan would include specific procedures and information on erosion and sedimentation control, spill prevention and control, construction staffing and hours, traffic control, and provisions for restoration and landscaping after construction of the Substation. The D&M Plan would also provide contact information should questions or concerns arise during construction or operation of the facility.

Prior to commencement of construction, CL&P intends to install erosion controls at the limits of work in accordance with the approved D&M Plan and the *2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control*. The erosion controls would be inspected and maintained throughout the course of the Project until final site stabilization has been achieved.

L.2 Construction-Related Activities

All construction activities would be conducted in accordance with the D&M Plan as approved by the CSC. The siting and design of the Substation provides for a sufficient setback from on-site wetlands and minimizes vegetation loss such that a natural tree and shrub buffer would be maintained. The driveway and Substation would be graded to contain stormwater runoff on the Property. The remainder of the stormwater would infiltrate through the gravel base of the Substation or would be allowed to run off through vegetated uplands.

During initial discussion with the Town of Waterford, CL&P was asked to evaluate what, if any, improvements could be achieved to sight lines at the intersection of Oil Mill Road and Waterford Parkway North as a part of the Project. Proposed construction activities would include removal of the existing vegetation and reduction of a soil berm in the southwest corner of the Property. As a result of vegetation removal and Site grade reduction in this area, the sight line northwestward (up Oil Mill Road) from the stop sign on Waterford Parkway North would increase from current conditions to a distance of approximately 250 feet.

L.3 Post-Construction Features

Upon completion of construction activities, all disturbed/exposed areas would be stabilized and re-vegetated. These areas would be dressed with topsoil and seeded with a New England conservation/wildlife mix, to establish a cover of native grasses, forbs, wildflowers and legumes that would provide both soil stability and wildlife habitat value. Erosion controls would remain in place until final site stabilization is achieved.

The power transformers within the Substation would contain insulating fluid. Surrounding each transformer will be secondary containment, consisting of a polyvinyl-lined sump, designed to hold 110% of a transformer's fluid capacity.

Effects on wildlife and wildlife habitat would be temporary disturbance during construction. The Property is currently used by wildlife species that are commonly found and are adaptable to minor habitat modifications. Based on the species identified and habitat types found on the Property and surrounding area, species diversity and abundance should be maintained after the Substation is completed and operational.

L.4 Construction Sequencing

Construction is expected to occur over a period of 12 to 15 months with the Substation in service by June 2010. The general construction sequence for the Substation and line interconnection would include:

- Installing erosion and sedimentation control barriers
- Constructing the driveway
- Removing trees and shrubs within the areas to be graded
- Preparing the Site (cut, fill, grading)
- Installing Substation foundations, conduits and grounding grid
- Spreading of trap rock
- Installing steel structures and Substation equipment
- Building transmission line interconnections
- Commissioning the Substation
- Completing Site restoration activities
- Removing erosion and sedimentation control barriers

M. HEALTH AND SAFETY

M.1 Electric and Magnetic Fields

Electric fields ("EF") are produced within the surrounding area of a conducting object (e.g., a wire) when a voltage is applied to it. EF are measured in units of kilovolts per meter ("kV/m"). The level of an EF near to an energized power line depends on the applied voltage, the distance between the conductors, and the distance to the measurement location.

Magnetic fields ("MF") are produced within the surrounding area of a conductor or device which is carrying an electric current. MF are measured in units of milliGauss ("mG"). The level of a MF near to line conductors carrying current depends on the magnitude of the current, the distance between conductors, and the distance from the conductors to the measurement location.

Both electric and magnetic fields decrease rapidly as the distance from the source increases, and even more rapidly from electric equipment in comparison to line conductors. EF are further weakened by obstructions such as trees and building walls, while MF pass through most obstructions. In the case of parallel lines of circuit conductors, the levels of EF and MF are also dependent on the phasing of the circuits.

The highest levels of electric and magnetic fields around the perimeter fence of a substation occur where transmission and distribution lines cross over or under the substation boundary. The levels of fields from substation equipment decrease rapidly with distance, reaching very low levels at relatively short distances beyond the fenced-in equipment. Substation-caused MF off the property of a substation will commonly be in the same range as the background MF levels in homes, which commonly range up to 4 mG.

At and beyond the boundaries of the Property, the predominant existing source of power-frequency electric and magnetic fields ("EMF") is the transmission circuits (circuits 1500 and 1605). A row of steel poles supports these circuits, which extend side-by-side, from northeast to southwest, adjacent to the northern Property boundary (the 1605 circuit just crosses the northwest corner of the Property). The highest levels of EMF would be found on the northerly Property boundary and the northwesterly Property boundary where the 1605 transmission circuit crosses over the Property boundary. Field levels drop off rapidly with distance from a source, so the levels of EMF at all points south of these transmission circuits will be much lower than the levels found directly beneath the circuits. Many locations along the Property line, particularly on its southwest, eastern and southerly sides, are at relatively long distances from the transmission circuits where EMF levels from these circuits drop to negligible levels.

In general, any changes to the existing electric and magnetic field levels at points on the Substation property line are due to the following three factors:

1) physical changes to the 1605 transmission circuit to interconnect it with the Substation;

2) changes to the Substation and associated distribution load shifts from other substations will cause changes to currents flowing on the transmission circuits;

3) new underground distribution circuit getaway cables from the Substation which cross under property lines, and

The Substation equipment itself will not cause noticeable changes to the existing EMF on the Property line.

CL&P is currently evaluating what changes specifically would occur to EMF levels at the Property lines as a result of the Project. This information will be provided in the CSC Application.

M.2 Site Security

A seven-foot-high chain link fence topped with one foot of barbed wire (three strands) would enclose the Substation yard to prevent unauthorized access. The Substation yard would also be gated and locked. All gates would be padlocked at the end of the workday during construction activities and at all times once the Substation is in service. Appropriate signage would be posted at the Substation alerting the general public of high voltage facilities located within the Substation. Should equipment experience a failure, protective relaying would immediately remove the equipment from service, thereby protecting the public and the equipment within the Substation. Other devices installed within the Substation would constantly monitor the equipment to alert CL&P of any abnormal or emergency situations.

M.3 Traffic Considerations and Hours of Operation

Construction traffic would not greatly affect local traffic because Waterford Parkway North provides direct access from I-95 southbound. Access would be gained from the proposed, at-grade driveway to be established along Waterford Parkway North. Post-construction site conditions would not substantially affect existing traffic patterns. Once construction of the Substation is complete, the facility may be remotely operated, with personnel onsite only for periodic inspections, maintenance and emergency work.

N. PROJECT SCHEDULE

Construction is expected to occur over a period of 12 to 15 months with the Substation in service by June 2010.

Appendix A – Comments from Commissions

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

TOWN OF WATERFORD, CT
PLANNING DEPARTMENT

Date: February 14, 2008
To: Waterford Conservation Commission
Cc: Girish Behal; Project Manager, Northeast Utilities Systems

Re: CL&P Proposed Waterford Substation
325 Waterford Parkway North
Request For Location Review: CT Siting Council Jurisdiction

Review Comments:

Site of substation is located in area of mapped Agawam sandy loam soil type. This is a well-drained soil formed in glacial outwash. Soil test borings document sandy subsoil conditions with depth to seasonal water in excess of 6 ft. below grade.

The vegetation in the proposed substation area is second growth woodland, dominated by red cedar. Understory is relatively open.

Activity proposed within 100 ft of the delineated perennial watercourse includes clearing of vegetation, grading, placement of crushed stone substrate and installation of a biofiltration swale and level spreader outlet.

Plan Comments:

1. Relocate perimeter hay bale/silt fence barrier closer to limit of disturbance to reduce clearing and soil disturbance in vicinity of wetland flag #s 17 and 18.

2. Plan needs to identify limits of clearing and disturbance. These should be located as close as possible to crushed stone pad, providing required maintenance/access area.

3. Add sediment controls in the southwest portion of the site near the intersection of Oil Mill Road.

4. The proposed biofiltration swale is sized to accommodate an estimated 480 cubic ft. of run-off volume. This is less than 0.2 of the WQV estimated from the substation pad, presuming no infiltration. With an estimated 50% infiltration from the crushed stone, the QV is 2180 cubic feet. The swale does not provide for capture and treatment of the water quality volume in accordance with the 2004 CT Stormwater manual. Identify what criteria were applied in the design.

5. With the minimal capacity, the anticipated high infiltration rate of the existing subsoil, use of crushed stone for the substation pad, it is not clear the added disturbance for the swale and level

spreader in the vicinity of the perennial stream provides greater benefit than the option of leaving the existing soils and vegetation in place.

If it is determined that providing some run-off control at the edge of the substation pad is preferable, then consider reducing the length of this swale to reduce the amount of encroachment into the area adjacent to wetland flags 17 and 18. Consider elimination or reduction of swale length. An existing depressional swale occurs along the north edge of Parkway North between the proposed station and the stream. This feature may serve to collect and direct run-off from the site.

6. Provide a construction detail for the level spreader if it remains part of the stormwater control plan.

7. The well-drained nature of the site soils will affect what vegetation can establish in the swale and surrounding areas. Use of drought-tolerant species and seed mixes is recommended.

Submitted By:

_____

Maureen FitzGerald
Environmental Planner
2/14/08

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

TOWN OF WATERFORD

PERMITTING DEPARTMENT

DATE: March 7, 2008

TO: Waterford Planning and Zoning Commission

FROM: Thomas V. Wagner, AICP, Planning Director

RE: LOCATION REVIEW
CL&P SUBSTATION
325 WATERFORD PARKWAY NORTH –

This is a request for location approval to site a substation on the above referenced property as described in the report entitled "Waterford Planning and Zoning Commission Location Review, Proposed Waterford Substation, prepared by VHB Inc. dated February 2008." The installation of the substation requires action by the Connecticut Siting Council and as part of the application the State requires input from the Planning and Zoning Commission on the appropriateness of the location selected. The following findings and determinations are made relative to the proposed substation location:

1. The proposed location is at the intersection of Waterford Parkway North and Oil Mill Road. It is located adjacent to an existing 115 Kv transmission line to which the station will be connected.
2. There were six sites considered as detailed in the report referenced above. The Planning and Zoning Commission concurs that the subject site is the best location because of accessibility, location adjacent to I-95 and capacity to accommodate the use and future expansion.
3. The subject site is located in a Rural Residential Zoning District which allows by special permit "Buildings and structures and sub-stations operated by utility companies....", and therefore the proposed use is consistent with the comprehensive plan for the community.
4. The site is also adjacent to the industrial districts which define the "Business Triangle" and are located within the area created by the intersection of I-95, I-395 and CT Route 85. The Commission accepts that there is a need for this

substation if the future development of the town is to occur in accordance with the 1998 Plan of Preservation, Conservation and Development.

5. As part of the review and expected future submission of more detailed plans the Commission acknowledges that specific conformance to the Zoning Regulations is not required, but that certain proposed on site improvements as well as off site impacts be considered.

    a. Final plans conform to the State of Connecticut Stormwater manual as well as Erosion Control Guidelines. In addition the recommendations of the Waterford Conservation Commission as issued are addressed.

    b. The plan was reviewed with respect to the future widening of I-95 and completion of Route 11 and a determination made that these infrastructure priority projects will not be impacted by the location of the substation.

    c. The site line at the intersection of Oil Mill Rd. and Waterford Parkway North is proposed to be improved. The fence surrounding the substation is proposed to be installed adjacent to Oil Mill Road. It is requested that the maximum site line achievable as calculated using Fhwa standards be accommodated as measured at the stop sign. Additional clearing and grading proposed that will not assist with site line improvement at the intersection and could provide some screening of the substation should be retained.

This document constitutes the Planning and Zoning Commission's position on the proposed location of the substation. The Commission will be participating in the application review process which may include the issuance of an order to regulate and restrict.

Appendix B
Site Plan Drawings

Concept Plans

Issued for: **Municipal Consultation Filing**

Date Issued: March 14, 2008

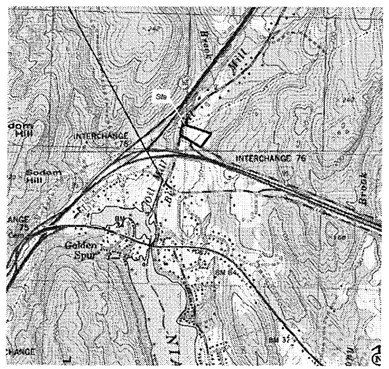
Latest Issue: March 21, 2008

Index

No.	Drawing Title	Latest Issue
Cp-1	Layout Plan	03/14/08
Cp-2	Grading, Drainage & Erosion Ctrl. Plan	03/14/08
Cp-3	Sightline Profile	03/21/08
	Reference Drawings	
Sv-1	Property Survey	10/15/07

Waterford Substation

325 Waterford Parkway North
Waterford, Connecticut



Site Location Map

* **Property Information**

Owner:
The Connecticut Light and Power Company
P.O. Box 270
Hartford, Connecticut 061414-0270
(860) 605-5000

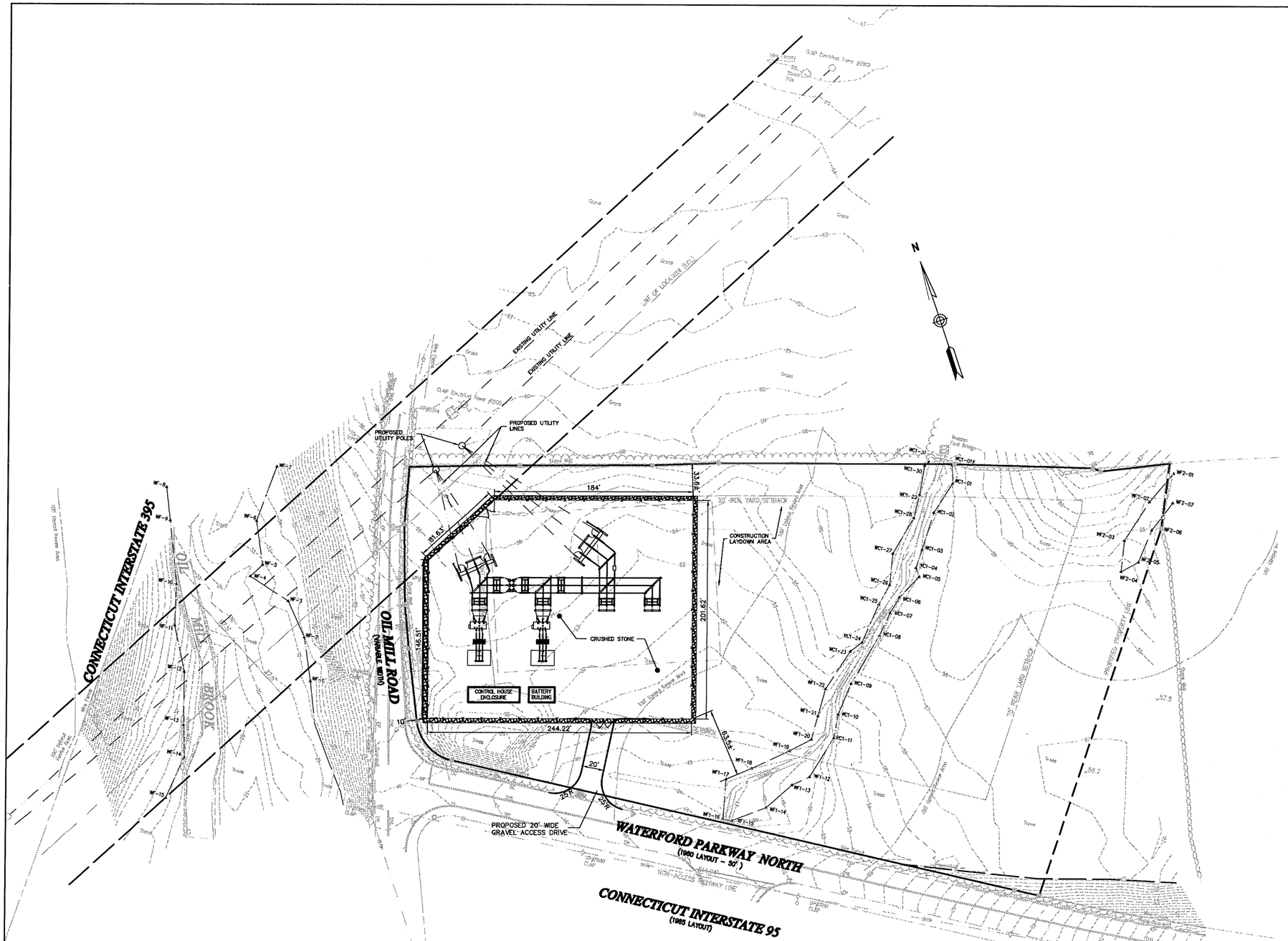
Applicant:
The Connecticut Light and Power Company
P.O. Box 270
Hartford, Connecticut 061414-0270
(860) 605-5000

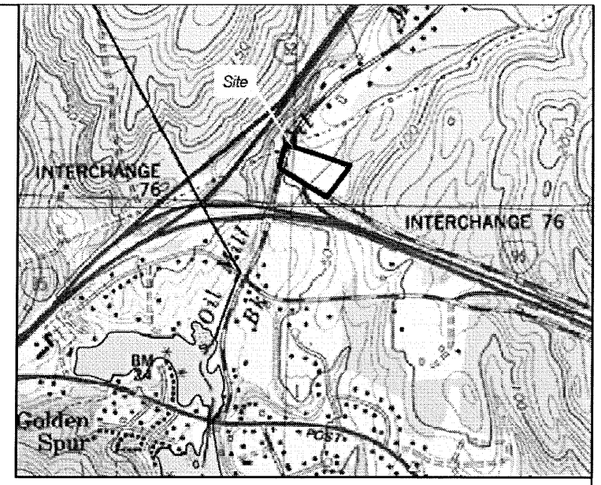
Assessor's Plat: Map 88
Lot: 287

* **Note: CL&P purchased (December 2007) five acres of a 55±acre parcel. No parcel lot number has been established for the new 5 acre piece. The parcel has been assigned a street address as shown above.**

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services

VHB Project No. 41357
325 Waterford Parkway North, Connecticut
Issued for: Municipal Consultation Filing - March 21, 2008





Connecticut Light & Power

The Northeast Utilities System

Progress Print
Not For Construction

Vanasse Hangen Brustlin, Inc.
Transportation • Land Development • Environmental Services
54 Tuttle Place, Middletown, Connecticut 06457-1847
Tel: 860 632-1500 • Fax: 860 632-7879

PLANS AND SPECIFICATIONS ARE SUBJECT TO REVISIONS PENDING FINAL SITING COUNCIL APPROVAL

CAD GENERATED DWG

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

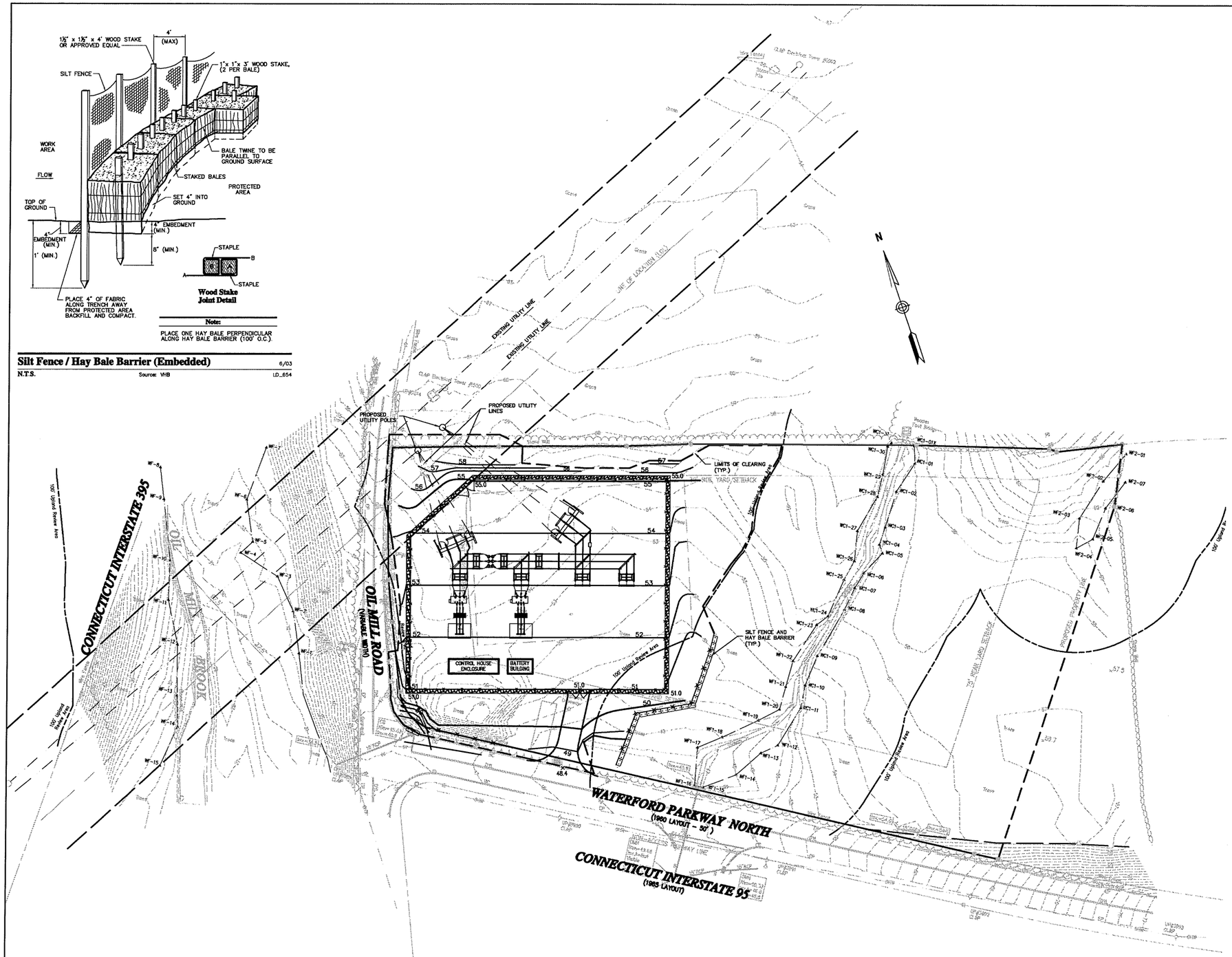
FOR THE CONNECTICUT LIGHT & POWER COMPANY

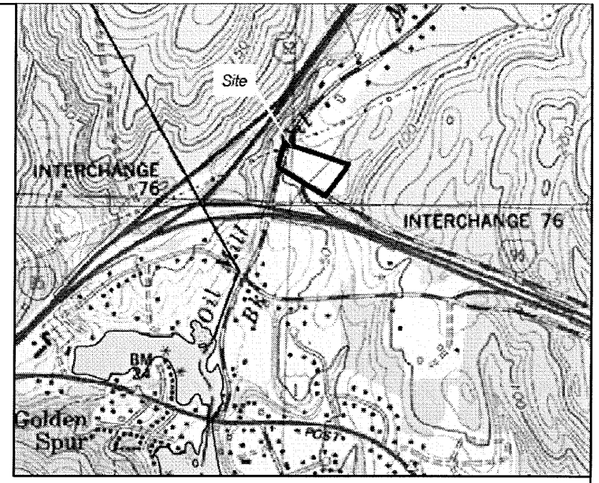
TITLE
Layout Plan
Waterford Substation
Waterford, Connecticut

BY		CHKD		APP	APP
DATE	03/14/08	DATE		DATE	DATE
SCALE	1"=50'			DWG. NO.	**Cp-1**

Silt Fence / Hay Bale Barrier (Embedded) 6/03

N.T.S. Source: VHB LD_654





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CAD GENERATED DWG

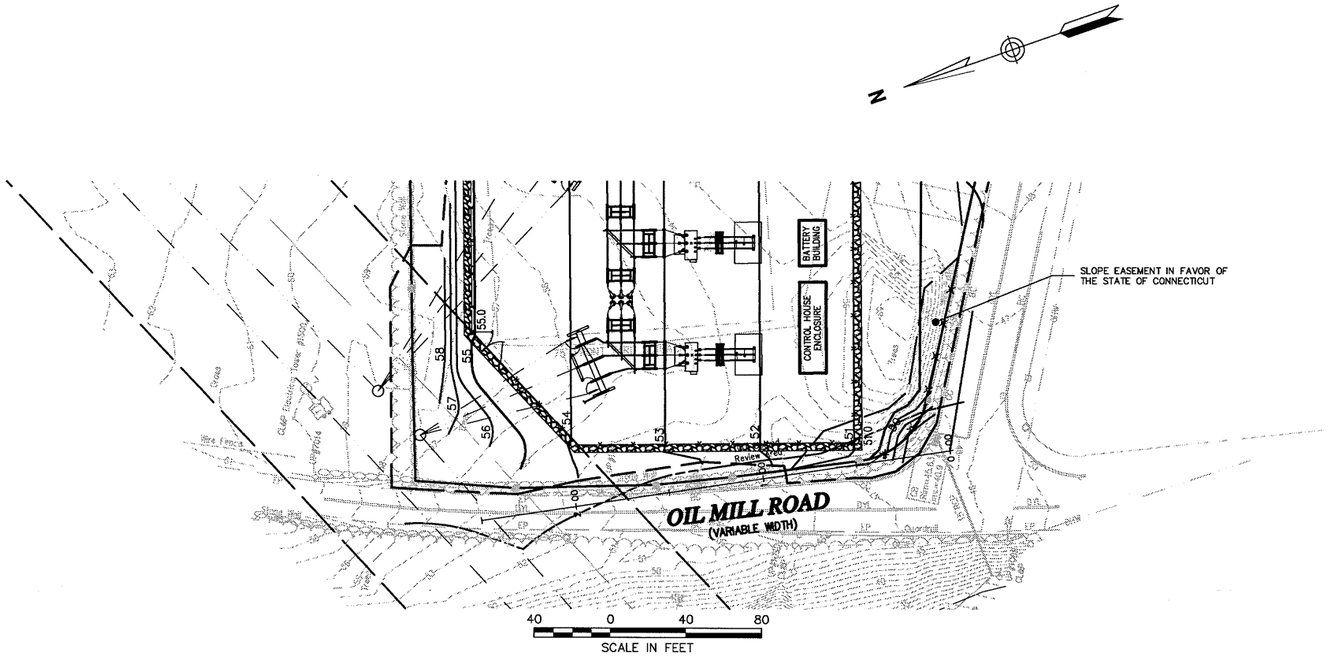
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Grading, Drainage & Erosion Ctrl. Plan
Waterford Substation
Waterford, Connecticut

BY		CHKD		APP	APP
DATE	03/14/08	DATE		DATE	DATE
SCALE	1"=50'			DWG. NO.	CP-2



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CAD GENERATED DWG

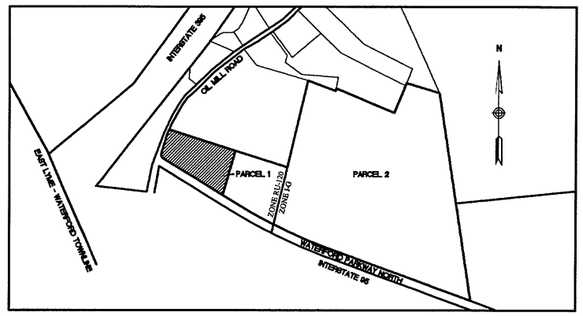
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP
	1.	03/21/08	SIGHTLINE PROFILE				

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Sightline Profile
Waterford Substation
Waterford, Connecticut

BY	CHKD	APP	APP
DATE 03/14/08	DATE	DATE	DATE
SCALE 1"=40'		DWG. NO. **CP-3**	

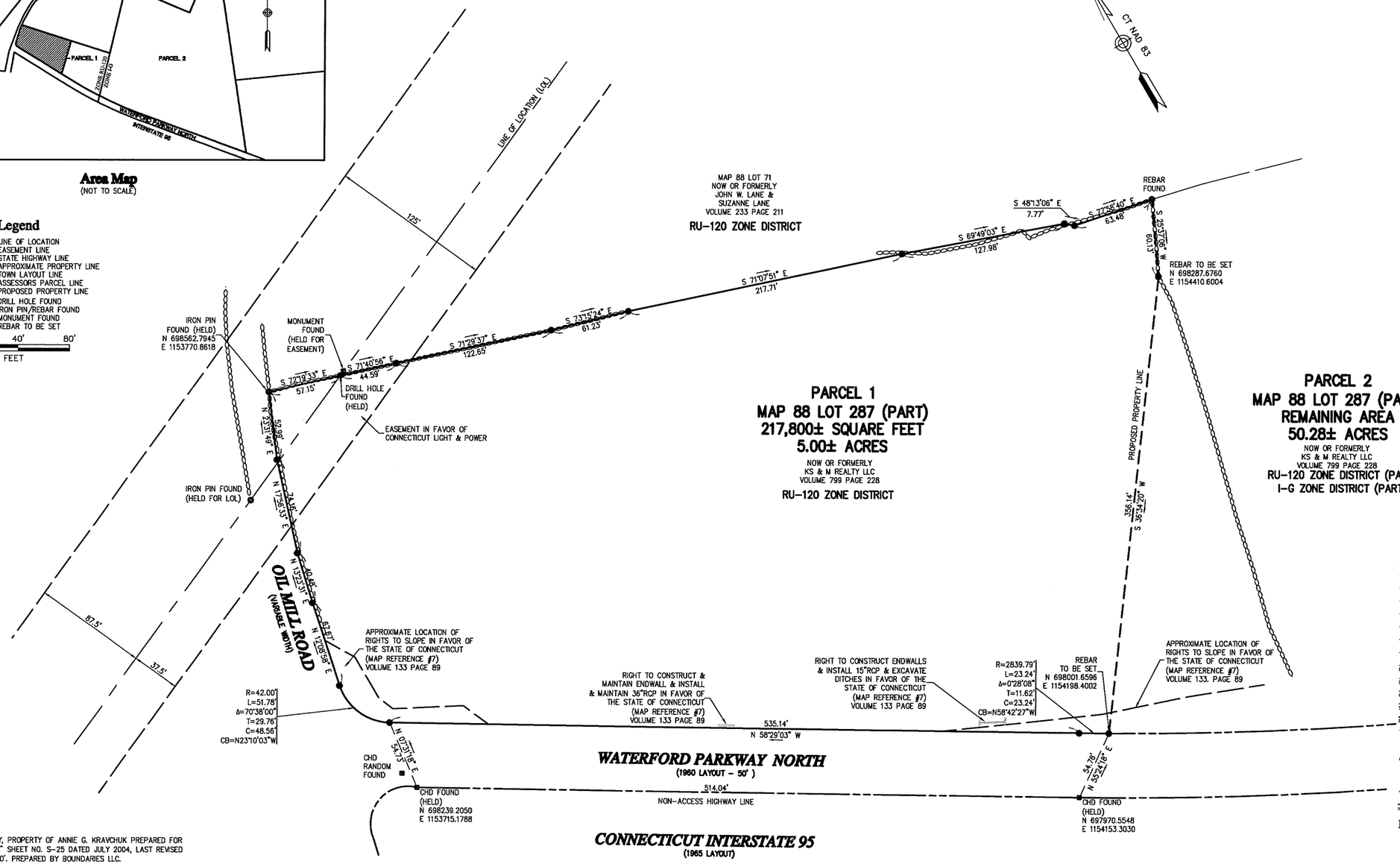


Area Map
(NOT TO SCALE)

Legend

- LINE OF LOCATION
- EASEMENT LINE
- STATE HIGHWAY LINE
- APPROXIMATE PROPERTY LINE
- TOWN LAYOUT LINE
- ASSESSORS PARCEL LINE
- PROPOSED PROPERTY LINE
- DRILL HOLE FOUND
- IRON PIN/REBAR FOUND
- MONUMENT FOUND
- REBAR TO BE SET

40' 0 40' 80'
SCALE IN FEET



PARCEL 1
MAP 88 LOT 287 (PART)
217,800± SQUARE FEET
5.00± ACRES
NOW OR FORMERLY
KS & M REALTY LLC
VOLUME 799 PAGE 228
RU-120 ZONE DISTRICT

PARCEL 2
MAP 88 LOT 287 (PART)
REMAINING AREA
50.28± ACRES
NOW OR FORMERLY
KS & M REALTY LLC
VOLUME 799 PAGE 228
RU-120 ZONE DISTRICT (PART)
I-G ZONE DISTRICT (PART)

Map References

1. MAP TITLED "PERIMETER SURVEY, PROPERTY OF ANNIE G. KRAVCHUK PREPARED FOR CARRAIGE HOUSE MERCEDES-BENZ" SHEET NO. S-25 DATED JULY 2004, LAST REVISED FEBRUARY 16, 2005, SCALE 1"=100'. PREPARED BY BOUNDARIES LLC.

2. OVERALL SITE PLAN LAYOUT FOR PROPOSED AUTO DEALERSHIP. PREPARED BY E.H. WENKE & ASSOCIATES, P.C. SHEET S-06, SCALE 1"-100', DECEMBER 2003.

3. MAP TITLED "COHANZIE JCT. – FLANDERS S/S 115 KV LINE PLAN & PROFILE" BY NORTHEAST UTILITIES SERVICE CO. DWG. NO. 01087-10002 DATED 12/30/71 SHEET 3 OF 4

4. MAP TITLED "MAP SHOWING EASEMENT AREA TO BE GRANTED TO CONNECTICUT LIGHT AND POWER COMPANY ACROSS THE PROPERTY OF JOHN W. AND SUZANNE M. LANE #71 OIL MILL ROAD WATERFORD, CT" PROJECT NUMBER 00-346-460 BY DIVERSIFIED TECHNOLOGY CONSULTANTS DATED 7/2/02

5. MAP TITLED "LOCATION OF RIGHT OF WAY OF THE CONNECTICUT LIGHT & POWER COMPANY ACROSS THE PROPERTY OF ANDREW DOMBROWSKI & ESTATE OF MARY E. DOMBROWSKI" DATED MAY 1943

6. MAPS TITLED "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF WATERFORD INTERSTATE ROUTE 95 FROM EAST LYME TOWN LINE EASTERLY TO TYKE LANE" DATED OCTOBER 18, 1965 NUMBER 152-12 SHEET NUMBER 1 AND 2 OF 5

7. MAP TITLED "TOWN OF WATERFORD MAP SHOWING LAND, EASEMENTS & RIGHTS OF ACCESS ACQUIRED FROM ANNIE G. KRAVCHUK" PROJECT NO. 152-55 DATED SEPTEMBER 1960, SHEET 1 OF 4

Zoning Summary Chart - Parcel 1

Zoning District(s): RU-120

Zoning Regulation Requirements	Required	Provided
MIN. LOT AREA	120,000 SF	217,000± SF
FRONTAGE	150 FT	235.3± FT
FRONT YARD SETBACK	75 FT*	NA
SIDE YARD SETBACK	30 FT	NA
REAR YARD SETBACK	75 FT	NA
MIN. LOT WIDTH	200 FT	277.5±
MAX. BUILDING HEIGHT	35 FT	NA
MAX. BUILDING COVERAGE	15%	NA

Zoning Summary Chart - Parcel 2

Zoning District(s): RU-120 & I-G

Zoning Regulation Requirements	Required R-120	Required I-G	Provided
MIN. LOT AREA	120,000 SF	40,000 SF	50.28 ACRES±
FRONTAGE	150 FT	125 FT	2,490± FT
FRONT YARD SETBACK	75 FT*	150 FT**	NA
SIDE YARD SETBACK	30 FT	30 FT	NA
REAR YARD SETBACK	75 FT	50 FT	NA
MIN. LOT WIDTH	200 FT	150 FT	2350± FT
MAX. BUILDING HEIGHT	35 FT	40 FT	NA
MAX. BUILDING COVERAGE	15%	40%	NA

* FRONT YARD – 50 FEET, EXCEPT WHEN LOTS FRONT A STATE HIGHWAY, THE MINIMUM SETBACK SHALL BE 75 FEET.

** FRONT YARD – 75 FEET, EXCEPT WHEN LOTS ABUTTING FRONTAGE ROAD PARALLELING INTERSTATE 95, THE MINIMUM FRONT YARD SETBACK SHALL BE 150 FEET.

THIS SURVEY AND MAP HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

THIS IS A SUBDIVISION MAP CONFORMING TO A HORIZONTAL CLASS A-2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY AND A SUBDIVISION SURVEY.

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON. THIS PLAN IS NOT VALID WITHOUT A LIVE SIGNATURE AND EMBOSSED SEAL.

CHRISTOPHER C. DANFORTH, L.S. #70118 DATE

VHB
Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

54 Tuttle Place
Middletown, Connecticut 06457
860-632-1500 • FAX 860-632-7879

No.	Revision	Date	Appvd.

Designed by | Drawn by MTD | Checked by
CAD checked by CCD | Approved by
Scale 1"=40' | Date October 15, 2007

Project Title
Waterford Parkway North & Oil Mill Road

Waterford, Connecticut

Issued for
Proposed Property Division Map

Drawing Title
Property Survey

STATE OF CONNECTICUT · CHRISTOPHER C. DANFORTH · NO. 70118 · LICENSED LAND SURVEYOR

Drawing Number
Sv-1

Sheet 1 of 2

Project Number
41357

Appendix C – Wetlands
Delineation Report

Vanasse Hangen Brustlin, Inc.

WETLANDS DELINEATION REPORT

Date: November 20, 2007

Project No.: 41357.00

Prepared For: The Connecticut Light and Power Company

Site Location: Oil Mill Road (ROW) & Waterford Parkway North
Waterford, CT

Site Map: Wetlands Sketch Map, Dated September 14, 2007

Inspection Date: September 14, 2007

Field Conditions: Weather: sunny, low 80's
Snow Depth: 0 inches
General Soil Moisture: dry
Frost Depth: 0 inches

Type of Wetlands Identified and Delineated:

Connecticut Inland Wetlands and Watercourses	☒
Tidal Wetlands	☐
U.S. Army Corps of Engineers	☒

Local Regulated Upland Review Areas: Wetlands: 100 feet Watercourses: 100 feet

Field Numbering Sequence of Wetlands Boundary: WC 1-01X to WC 1-11, WF 1-12 to 1-22, WC 1-23 to 1-31, WF 2-01 to 2-07

[as depicted on attached wetland sketch map]

The classification systems of the National Cooperative Soil Survey, the U.S. Department of Agriculture, Natural Resources Conservation Service, County Soil Survey Identification Legend, Connecticut Department of Environmental Protection and United States Army Corps of Engineers New England District were used in this investigation.

All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

The wetlands delineation was conducted and reviewed by:

Matthew Davison
Registered Soil Scientist

Enclosures

54 Tuttle Place
Middletown, Connecticut 06457-1847
860.632.1500 ▪ FAX 860.632.7879
email: info@vhb.com
www.vhb.com

Attachments

- Wetland Delineation Field Form
- Soil Map
- Soil Report
- Wetland Delineation Sketch Map
- Wetland Delineation Map

Wetland Delineation Field Form

Project Address:	Oil Mill Road & Waterford Parkway North	Project Number:	41357.00
Inspection Date:	September 14, 2007	Inspector:	Matthew Davison
Wetland I.D.:	Wetland & Watercourse 1		

Field Conditions:	Weather: sunny, low 80s	Snow Depth: 0
	General Soil Moisture: dry	Frost Depth: 0
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☒	
	Tidal ☐	
Field Numbering Sequence: WC 1-01X to 1-11, WF 1-12 to 1-22, WC 1-23 to 1-31		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☒
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☒
Permanently Saturated ☐	Seasonally Saturated – seepage ☐	Seasonally Saturated - perched ☐
Comments: Perennial watercourse with associated wetland soils.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☒	Palustrine ☐
Lacustrine ☐	Marine ☐	
Comments: Perennial watercourse		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☒	Disturbed ☐	Wet Meadow ☐
Comments: Perennial watercourse		

WATERCOURSE TYPE:

Perennial ☒	Intermittent ☐	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton	☐	☒	☒	☒
Ridgebury and Leicester	☒	☐	☐	☒
Agawam	☐	☒	☒	☒
Udorthent	☐	☒	☒	☒

DOMINANT PLANTS:

sweet pepperbush	
spicebush	
white ash	
winterberry	
New York fern	

WETLAND NARRATIVE:

Perennial watercourse flows through property from north to south. Watercourse channel is well defined, a result of stones placed along each bank during previous agricultural land use. Barbed wire remnants along streambanks and adjacent old field habitat are further evidence of previous land use. Watercourse exits property through culvert under Waterford Parkway North. Stream banks are less defined in this area and narrow forested bordering wetlands and wetland soils exist to each side of the stream.

Wetland Delineation Field Form

Project Address:	Oil Mill Road & Waterford Parkway North	Project Number:	41357.00
Inspection Date:	September 14, 2007	Inspector:	Matthew Davison
Wetland I.D.:	Wetland 2		

Field Conditions:	Weather: sunny, low 80s	Snow Depth: 0
	General Soil Moisture: dry	Frost Depth: 0
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☒	
	Tidal ☐	
Field Numbering Sequence: WF 2-01 to 2-07		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments:		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: Associated with larger wetland system to east.		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: Associated with larger wetland system to east.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton	☐	☒	☒	☒
Ridgebury and Leicester	☒	☐	☐	☒
Agawam	☐	☒	☒	☒

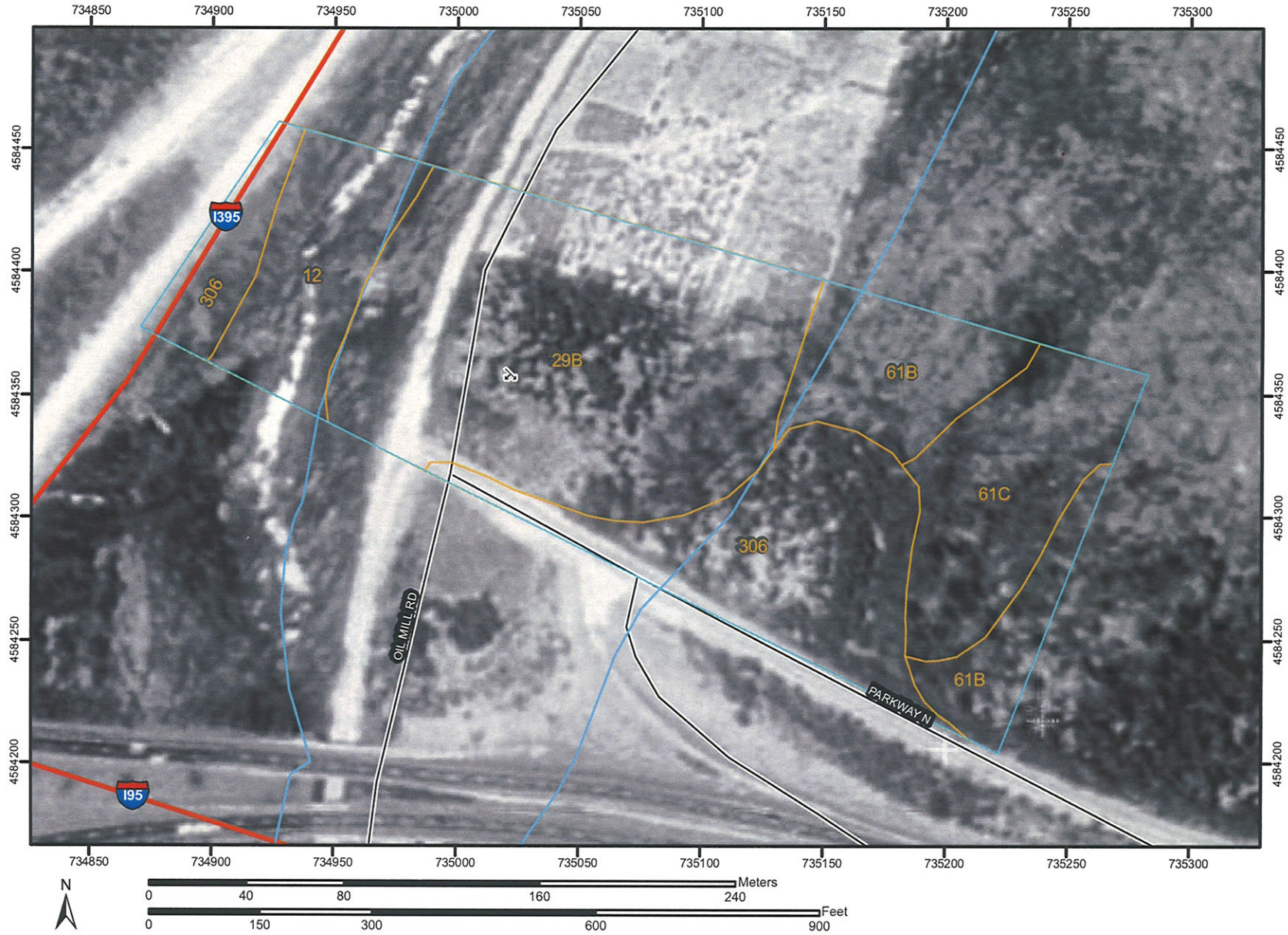
DOMINANT PLANTS:

New York fern	
black birch	
red cedar	

WETLAND NARRATIVE:

Small finger of wetland located immediately east of proposed property boundary. This wetland is an extension of a larger system, including a probable vernal pool located approximately 100 feet northeast and off the site. This area exists at a contact point between upland till and glacial outwash soils.

Soil Map–State of Connecticut
(Oil Mill Road & Waterford Parkway North, Waterford, CT)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Date(s) aerial images were photographed: 4/12/1991

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
12	Raypol silt loam	1.3	10.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	4.9	39.4%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	1.7	14.0%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	1.7	13.6%
306	Udorthents-Urban land complex	2.8	22.9%
Totals for Area of Interest (AOI)		12.4	100.0%

Map Unit Description (Brief)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the selected area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The "Map Unit Description (Brief)" report gives a brief, general description of the major soils that occur in a map unit. Descriptions of nonsoil (miscellaneous areas) and minor map unit components may or may not be included. This description is written by the local soil scientists responsible for the respective soil survey area data. A more detailed description can be generated by the "Map Unit Description" report.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief)

State of Connecticut

Description Category: SOI

Map Unit: 12—Raypol silt loam

Raypol Silt Loam This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 37 to 50 inches (940 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Raypol soils. 20 percent minor components. Raypol soils This component occurs on outwash plain terrace, depression, and drainageway landforms. The parent material consists of eolian deposits over sandy and gravelly glaciofluvial deposits. The slope ranges from 0 to 3 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 7.3 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 6 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w Typical Profile: 0 to 8 inches; silt loam 8 to 12 inches; very fine sandy loam 12 to 20 inches; silt loam 20 to 26 inches; silt loam 26 to 29 inches; very fine sandy loam 29 to 52 inches; stratified very gravelly coarse sand to loamy fine sand 52 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

Map Unit: 29B—Agawam fine sandy loam, 3 to 8 percent slopes

Agawam Fine Sandy Loam, 3 To 8 Percent Slopes This map unit is in the Connecticut Valley New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation Is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 50 degrees F. (7 to 10 degrees C.) This map unit is 80 percent Agawam soils. 20 percent minor components. Agawam soils This component occurs on valley and outwash plain terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage lass is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 4.8 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 8 inches; fine sandy loam 8 to 14 inches; fine sandy loam 14 to 24 inches; fine sandy loam 24 to 60 inches; stratified very gravelly coarse sand to fine sand

Map Unit: 61B—Canton and Charlton soils, 3 to 8 percent slopes, very stony

Canton And Charlton Soils, 3 To 8 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 61C—Canton and Charlton soils, 8 to 15 percent slopes, very stony

Canton And Charlton Soils, 8 To 15 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 306—Udorthents-Urban land complex

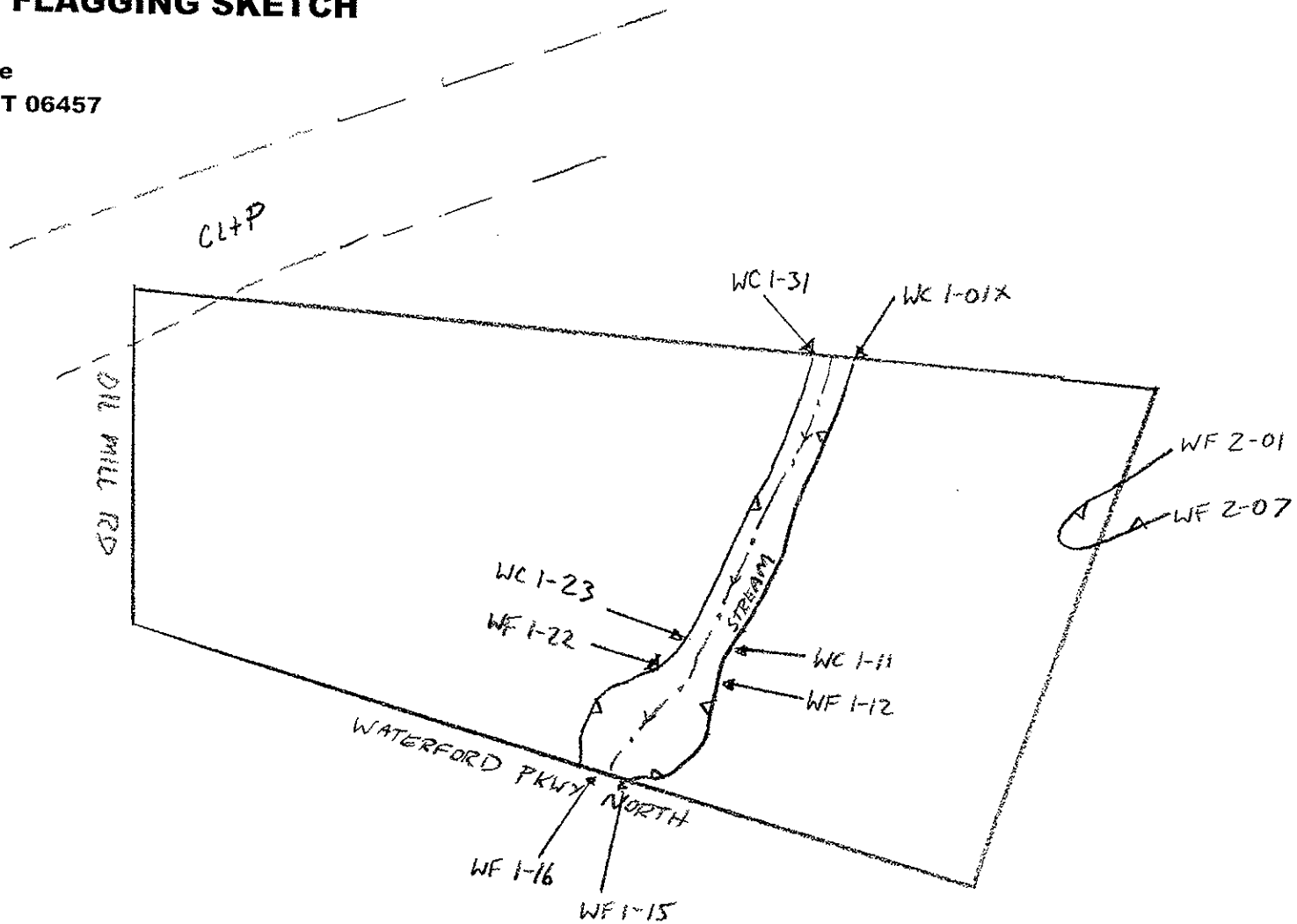
Udorthents-Urban Land Complex This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 50 percent Udorthents soils, 35 percent Urban Land. 15 percent minor components. Udorthents soils This component occurs on cut (road, railroad, etc.), railroad bed, road bed, spoil pile, urban land, fill, and spoil pile landforms. The slope ranges from 0 to 25 percent and the runoff class is medium. The depth to a restrictive feature varies, but is commonly greater than 60 inches. The drainage class is typically well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 9.0 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.4 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table is greater than 60 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 3e Typical Profile: 0 to 5 inches; loam 5 to 21 inches; gravelly loam 21 to 80 inches; very gravelly sandy loam Urban Land Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. The slope ranges from 0 to 35 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

WETLAND FLAGGING SKETCH

VHB, Inc.
54 Tuttle Place
Middletown, CT 06457



SITE LOCATION: Oil Mill Rd & Waterford Parkway North, Waterford CT
FLAGGED BY: Matthew Davison
DATE: September 14, 2007

Note: the information shown on this sketch, including the wetland boundary, is approximate. This map is intended for surveying purposes only.

Appendix D
SHPO Correspondence

Northeast Utilities System

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-4861

January 15, 2008

David Poirier, Staff Archaeologist
Connecticut Commission on Culture & Tourism
One Constitution Plaza, 2nd floor
Hartford, Connecticut 06103

Re: Proposed Substation
287 Waterford Parkway North
Waterford, Connecticut

Dear Mr. Poirier:

The Connecticut Light and Power Company ("CL&P") is considering the development of a new 115-kV substation for interconnection with existing overhead transmission facilities off Waterford Parkway North, in Waterford, Connecticut (the "Site"). The new substation is necessary to meet an increasing demand for electricity in the Waterford area. The proposed development of a new substation requires CL&P to submit an application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need. Consultation with your office is part of the application process.

The 5-acre Site currently exists as undeveloped land and is covered with moderate tree growth, with some small clearings and limited growth in its central portion. An easement area with overhead electric transmission lines is present in the northwest corner of the Site. The new 115-kV substation facility will interconnect with the existing transmission lines that extend generally east to west immediately north of the Site.

CL&P has reviewed the presence of cultural resources within the vicinity of the project Site depicted on the attached Cultural Resources Screen Map. The Cultural Resources screening did not reveal the existence of any historic or architectural resources listed or eligible for listing on the National Register of Historic Places at or within a 0.5-mile radius of the project Site.

Heritage Consultants, LLC completed a Phase IA Cultural Resources Assessment Survey of the project Site in November 2007. All work was conducted in accordance with the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended; and the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987).

We respectfully request a written opinion from your office regarding the potential effect or no effect of the proposed project on cultural resources. We have enclosed a USGS topographic Figure 1 Site Location Map, Figure 2 Aerial Photograph Map, Cultural Resources Screen Map, and Heritage Consultants, LLC's Phase IA Cultural Resources Assessment Survey to assist in your review. At your earliest convenience, please forward correspondence to my attention. Thank you in advance for your prompt consideration of this request. Should you have any questions, I may be reached at (860) 665-4861 or via email at marotsa@nu.com.

Sincerely,

NORTHEAST UTILITIES SERVICE COMPANY

Scott A. Marotta
Environmental Scientist

Enclosures
cc: D. Biondi, Northeast Utilities Service Company

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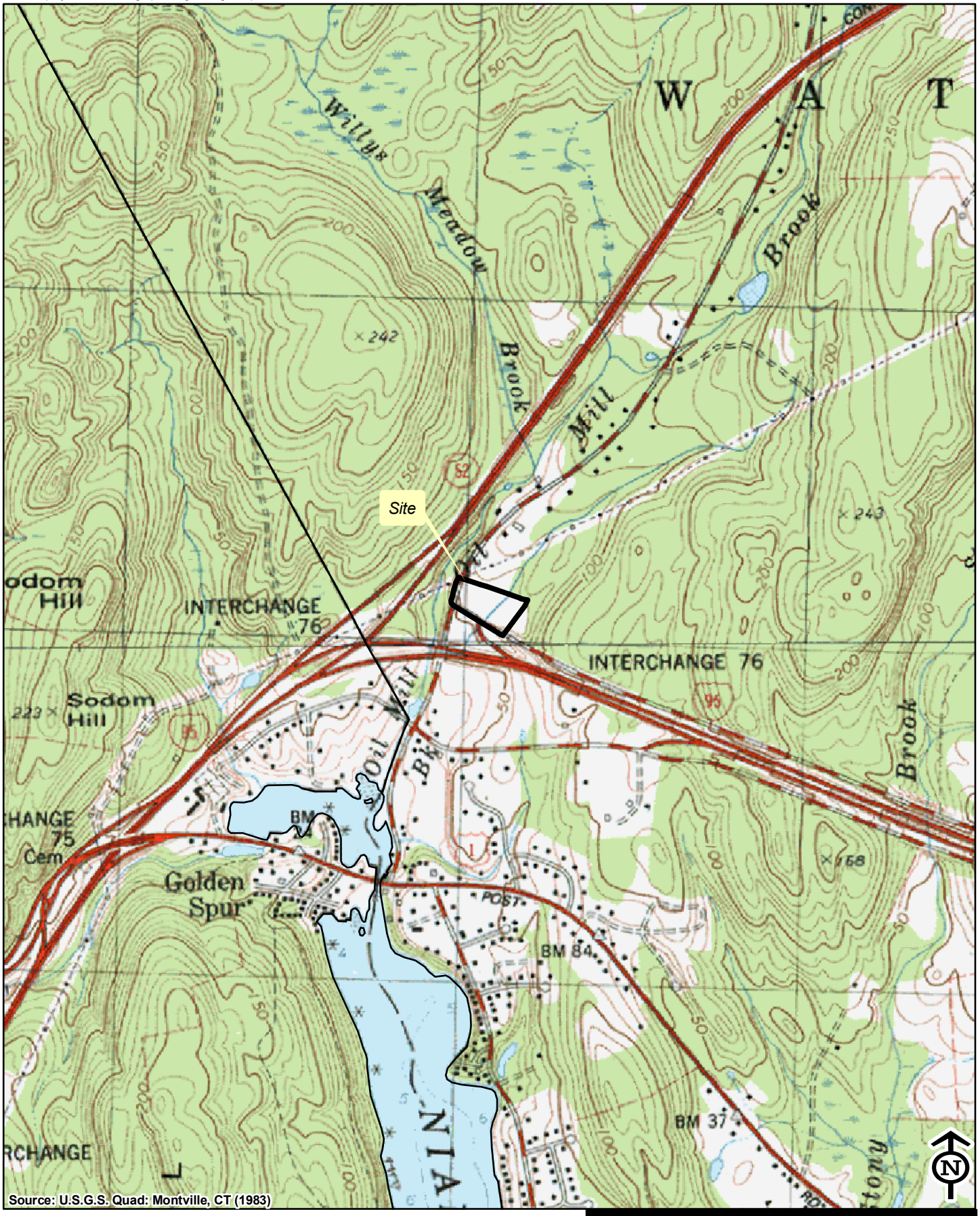
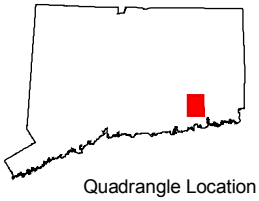


1,000 500 0 1,000 Feet

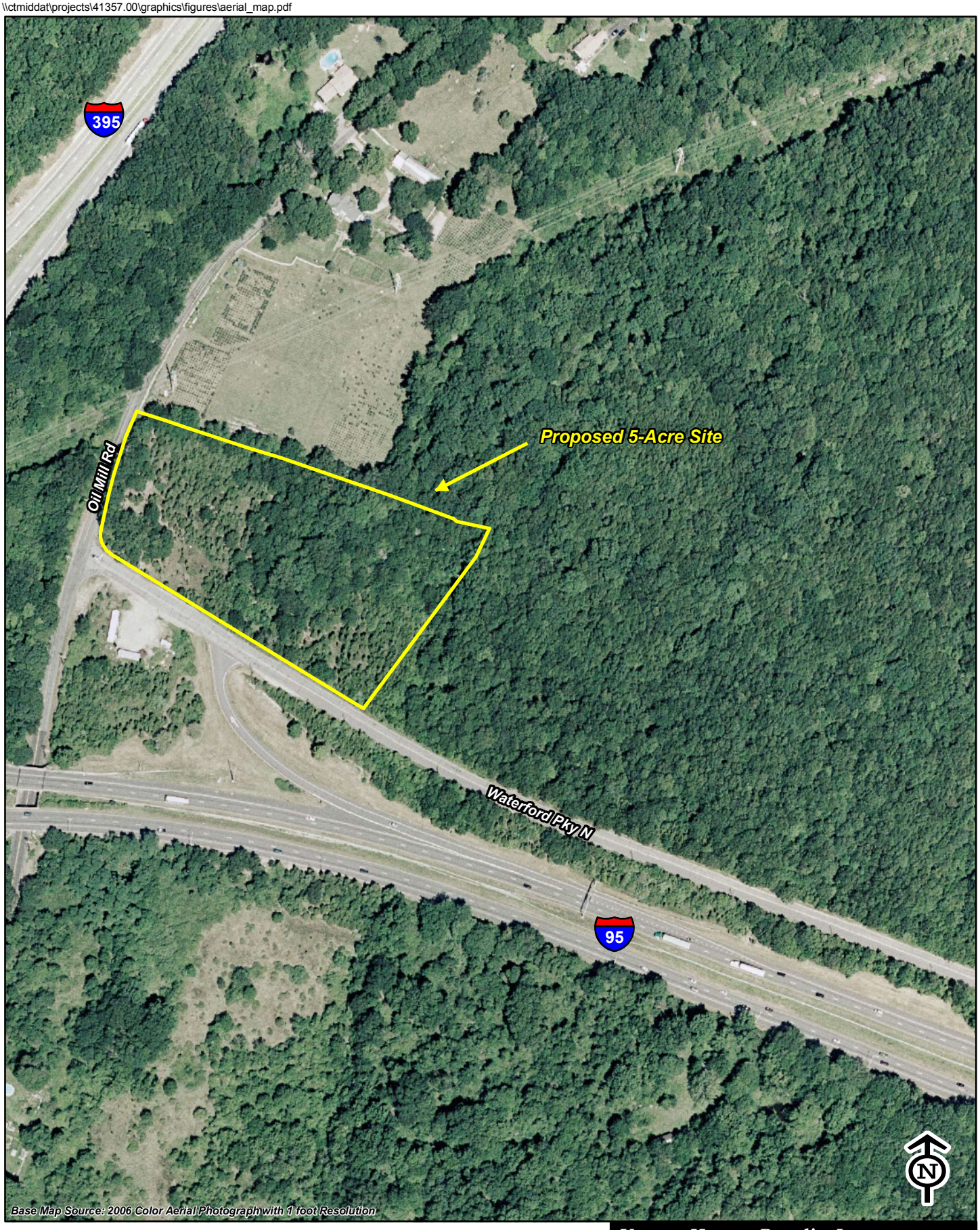
Vanasse Hangen Brustlin, Inc.



Quadrangle Location

Figure 1
Site Location
Waterford Parkway North
& Oil Mill Road
Waterford, CT

\\ctmiddat\projects\41357.00\graphics\figures\aerial_map.pdf



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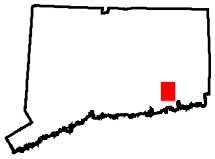
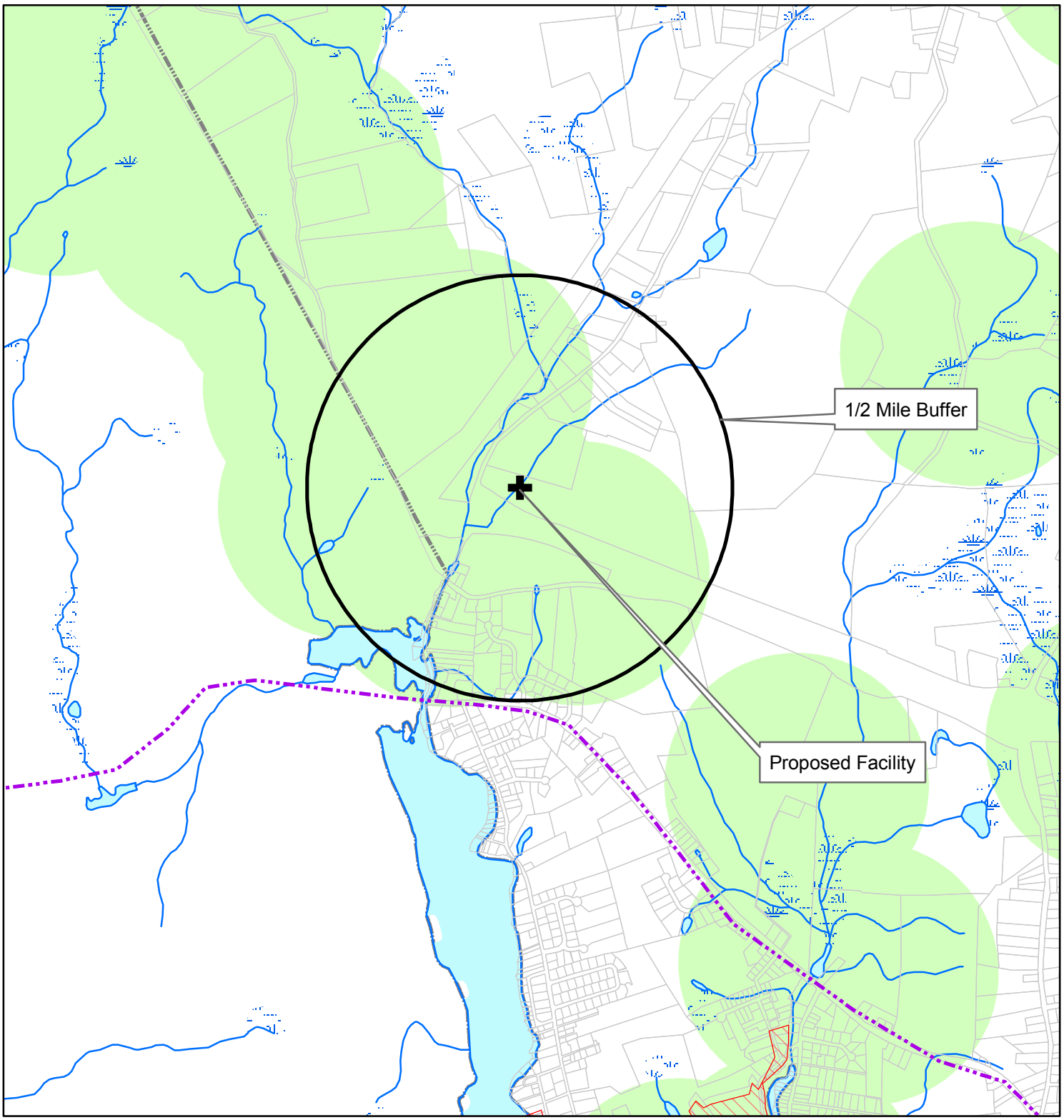
Feet



Quadrangle Location

Vanasse Hangen Brustlin, Inc.

Figure 2
Aerial Photograph
Waterford Parkway North
& Oil Mill Road
Waterford, CT



Legend

- Proposed Facility
- National Register (points)
- National Register (polygon)
- Local Historic District
- 1/2 Mile Buffer
- Historic Turnpikes
- Parcels
- Scenic Highways (CT)
- Reported Archaeological Sites

Vanasse Hangen Brustlin, Inc.

Cultural Resources Screen
PROPOSED SUBSTATION
287 WATERFORD PARKWAY NORTH
WATERFORD, CONNECTICUT
JANUARY 02, 2008
USGS QUAD: NIANTIC

N

0 0.35 0.7 Miles

Prepared for Vanasse Hangen Brustlin, Inc by Heritage Consultants- 2008

FINAL REPORT **NOVEMBER 2007**

PHASE IA CULTURAL RESOURCES ASSESSMENT SURVEY OF A PROPOSED DEVELOPMENT IN WATERFORD, CONNECTICUT

PREPARED FOR:

VANASSE HANGEN BRUSTLIN, INC.
54 TUTTLE PLACE
MIDDLETOWN, CONNECTICUT 06457

HERITAGE CONSULTANTS, LLC
877 MAIN STREET
NEWINGTON, CONNECTICUT 06111

TABLE OF CONTENTS

LIST OF FIGURES

1.0 Introduction

This report summarizes the results of a Phase IA Cultural Resources Assessment Survey of a proposed development in Waterford, Connecticut (Figure 1). Heritage Consultants, LLC, completed the field investigation portion of this project, performed on behalf of Vanasse Hangen Brustlin, Inc., on November 9, 2007. All work was conducted in accordance with the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended; and the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987). The remainder of this document presents a description of the Area of Potential Effect, information used as project context, the methods by which the current Phase IA cultural resources assessment survey was completed, results of the investigation, and management recommendations for the project.

2.0 Project Description

As mentioned above, the proposed development will be located in Waterford, Connecticut, specifically at the intersection of Waterford Parkway North and Oil Mill Road (Figures 1 and 2). The Area of Potential Effect consists of approximately 2 ha (5 ac) of land situated at an approximate elevation of 18 m (60 ft) NGVD. It is roughly bounded to the south by Waterford Parkway North, to the east by a forested parcel of land, to the north by a tree farm, and to the west by Oil Mill Road (Figure 2). At the time of survey, the project parcel was described as a wooded lot with limited areas of disturbance noted along the bounding roadways (i.e., to the south by Waterford Parkway North and to the west by Oil Mill Road). The details of the background research and field methods, as well as the results of this field effort, are reviewed below.

3.0 Methods

The current Phase IA cultural resources assessment survey consisted of the completion of the following tasks: 1) a study of the area's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to determine whether or not a cultural resources survey has been completed on the property and to determine whether or not archaeological resources have been noted within or immediately adjacent to the Area of Potential Effect; 3) a review of historic maps an aerial imagery depicting the proposed project parcel in order to identify potential historic resources and/or area of past disturbance; 4) pedestrian survey and photo-documentation of the proposed project parcel in order to determine the archeological sensitivity of the Area of Potential Effect; and 5) preparation of the current archeological assessment report.

4.0 Project Context: Previous Investigations, Natural & Prehistoric Settings, and Historic Overview

The following sections provide an overview of the region's natural and prehistoric settings, historic backdrop, and previous cultural resources investigations completed within the vicinity of the Area of Potential Effect. These brief discussions are included in an effort to provide contextual information relative to the location of the Area of Potential Effect, its natural characteristics, and its prehistoric and historic use and occupation. This section concludes with an overview of the previous cultural resources investigations that have taken place in the area and a discussion of their results.

4.1 Natural Setting

The Area of Potential Effect lies within the seaboard lowland portion of the New England Physiographic Province. A review of environmental characteristics identified in the vicinity of the proposed project area suggests that this location may once have been highly favorable to past human settlement and landuse. In particular, the proposed project parcel appears to be situated on a gently sloping topography near the headwaters of the Niantic River. This region is characterized by substantial amounts of glacial till situated atop bedrock. Surficial deposits located within the vicinity of the Area of Potential Effect primarily consist of Agawam fine sandy loam, 3 to 8 percent slopes, but Udorthents have been recorded along the southern and eastern boundaries of the project parcel (Figure 3). Vegetation within the immediate vicinity of the Area of Potential Effect consists of mixed deciduous trees; however, regionally represented flora

included deciduous forests, saltwater cordgrass, and tall reeds. Finally, local fauna include oyster, soft shell clam, brown trout, American eel, cunner, winter flounder, striped bass, rabbit, raccoon, deer, and a wide variety of terrestrial and aquatic bird species.

4.2 Prehistory of Connecticut

The earliest inhabitants of Connecticut, referred to as Paleo-Indians, probably arrived in the area after ca. 14,000 B.P. (Gramly and Funk 1990; Snow 1980). While there have been numerous finds of Paleo-Indian projectile points throughout Connecticut, only two sites, the Templeton Site (6-LF-21) and the Hidden Creek Site (72-163), have been studied in detail (Jones 1997; Moeller 1980). The Templeton Site (6-LF-21) is located in Washington, Connecticut on a terrace overlooking the Shepaug River. Carbon samples recovered during excavation of the site area produced a radiocarbon date of 10,190±300 B.P., for the occupation. In addition to a single large and two small fluted points, the Templeton Site produced gravers, drills, core fragments, scrapers, and channel flakes, indicating that the full range of lithic reduction took place within the site area (Moeller 1980). Moreover, use of both exotic and local raw materials was documented in the recovered lithic assemblage, suggesting that not only did the site's occupants spend some time in the area, but they also had access to distant lithic sources.

The only other Paleo-Indian site studied in detail is the Hidden Creek Site (72-163) (Jones 1997). Paleo-Indian artifacts recovered from this site include bifaces, side scrapers, a fluted preform, gravers, and end scrapers. While no direct date for the Paleo-Indian assemblage yet has been obtained, Jones (1997:76) argues that based on typological considerations the artifacts likely date from ca., 10,000 to 9,500 years ago. Further, based on the types and number of tools present, Jones (1997:77) has hypothesized that the Hidden Creek Site represents a short-term occupation. Excavation of both sites suggest that the Paleo-Indian settlement pattern consisted of a high degree of mobility, with groups moving regionally in search of seasonal food resources, as well as for high quality lithic materials.

The Archaic Period began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980). Later, Griffin (1967) and Snow (1980) divided the Archaic Period into three subperiods: the Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). To date, very few Early Archaic sites have been identified in southern New England. Like Paleo-Indian sites, Early Archaic sites tend to be very small and produce few artifacts, most of which are not diagnostic. Sites of this age are identified based on the recovery of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by their characteristic bifurcated base, and they generally are made from high quality lithics, though some quartz and quartzite specimens have been recovered. Current archeological evidence suggests that Early Archaic groups became more focused on locally available and smaller game species. Occupations of this time period are represented by camps that were moved periodically to take advantage of seasonal resources (McBride 1984).

By the onset of the Middle Archaic Period, increased numbers and types of sites are noted in the region (McBride 1984). The most well known Middle Archaic site in New England is the Neville Site (Dincauze 1976). Analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca., 7,700 and 6,000 years ago. These sites are associated with the recovery of Neville, Stark, and Merrimac projectile points. McBride (1984) noted that Middle Archaic sites in the lower Connecticut River Valley tend to be represented by moderate density artifact scatters representing a "diversity of site types, with both large-scale occupations and small special purpose present" (McBride 1984:96). Thus, based on the available archeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96).

The Late Archaic Period in southern New England is divided into two major cultural traditions: the Laurentian and Narrow-Stemmed Traditions (Funk 1976 McBride 1984; Ritchie 1969a and b). Laurentian

artifacts include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights and scrapers. The diagnostic projectile point forms of this time period include the Brewerton Eared-Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a). Current archeological evidence suggests that Laurentian populations consisted of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been identified and studied, they generally encompass less than 500 m^2 in area. These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1984:252).

The latter portion of the Late Archaic is represented the Narrow-Stemmed Tradition. It is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984). In general, the Narrow-Stemmed Tradition corresponds to when Late Archaic populations in southern New England began to "settle into" well-defined territories. Further, Narrow-Stemmed Tradition settlement patterns are marked by an increase in the types of sites utilized. That is, the Narrow-Stemmed Tradition witnessed the introduction of large base camps supported by small task-specific sites and temporary camps. The increased number of Narrow Stemmed Traditions temporary and task specific sites indicates frequent movements out of and back into base camps for the purpose of resource procurement; however, the base camps were relocated seasonally to position groups near frequently used, but dispersed, resources (McBride 1984:262).

The Terminal Archaic, which lasted from ca., 3,700 to 2,700 B.P., is represented by the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. Temporally diagnostic projectile points of this tradition include the Snook Kill, Susquehanna Broad, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). In addition, the material culture of the Terminal Archaic includes soapstone vessels, chipped and ground stone adzes, atlatl weights, drills, net sinkers, plummets and gorgets (Lavin 1984; McBride 1984; Ritchie 1969a and 1969b; Snow 1980). Susquehanna Tradition settlement patterns are centered around large base camps located in on terrace edges overlooking floodplains. Acting as support facilities for the large Terminal Archaic base camps were numerous task specific sites and temporary camps. Such sites were used as extraction points for the procurement of resources not found in the immediate vicinity of the base camps, and they generally were located adjacent to upland streams and wetlands (McBride 1984:282). Finally, there also are a large number of Terminal Archaic cremation cemeteries with burials that have produced broadspear points and radiocarbon dates between 3,700 and 2,700 B.P. (Pfeiffer 1990). Among the grave goods are ritually "killed" (intentionally broken) steatite vessels, as well as ground stone and flaked stone tools (Snow 1980:240); however, this represents an important continuation of traditions from the Late Archaic and it should not be regarded as a cultural trait unique to the Susquehanna Tradition (Snow 1980:244).

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been commonly divided into three subperiods: Early, Middle, and Late Woodland. The Early Woodland period of the northeastern United States dates from ca., 2,700 to 2,000 B.P. In his study of the lower Connecticut River Valley, McBride (1984) described Early Woodland sites as "characterized by a quartz cobble lithic industry, narrow-stemmed points, an occasional Meadowood projectile point, thick, cord-marked ceramics, and perhaps human cremations" (McBride and Soulsby 1989:50). Early Woodland sites tend to be located in a variety of different ecozones; however, the largest settlements associated with this period were focused on floodplain, terrace, and lacustrine environments (McBride 1984:300), suggesting "population aggregations along major rivers, interior lakes, and wetlands" (McBride and Soulsby 1989:50). In sum, archeological evidence indicates that Early Woodland populations consisted a mobile hunter/gatherers that moved seasonally throughout a diversity of environmental zones in search of

available plant and animal resources.

The Middle Woodland Period of southern New England prehistory is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). In Connecticut, the Middle Woodland Period is represented archeologically by the use of narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Middle Woodland period include Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a: 200). In terms of settlement patterns, the Middle Woodland period is characterized by the occupation of village sites by large co-residential groups. These sites were the principal place of occupation, and they were positioned in close proximity to major river valleys, tidal marshes, estuaries, and the nearby coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains.

The Late Woodland period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the earliest evidence for the use of maize in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1973, 1974; McBride 1984; Snow 1980). Late Woodland lithic assemblages typically contain up to 60 to 70 percent exotic lithics. Finished stone tools include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; netsinkers; and celts, adzes, axes, and digging tools (McBride 1984; Snow 1980). In addition, ceramic assemblages recovered from Late Woodland sites include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised types (Lavin 1980; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947).

Finally, McBride (1984:323-329) characterized Late Woodland settlement patterns as more nucleated than the preceding Middle Woodland ones, with fewer, larger sites situated in estuarine and riverine ecozones. Both river confluences and coastal zones were favored areas for the establishment of large village sites that contain numerous hearths, storage pits, refuse pits, ceramic production areas, house floors, and human and dog burials (Lavin 1988b; McBride 1984). McBride (1984:326) has argued that these sites certainly reflect multi-season use, and were perhaps occupied on a year-round basis (see also Bellantoni 1987). In addition to large village sites, McBride (1984:326) identified numerous temporary and task-specific sites in the uplands of the lower Connecticut River Valley and along the coastline. These sites likely were employed for the collection of resources such as plant, animal, and lithic raw materials. These sites tend to be very small, lack internal organizational structure, and usually contain a limited artifact assemblage and few cultural features, suggesting that they were occupied from only a few hours to perhaps overnight. Temporary camps, on the other hand reflect a longer stay than task-specific camps, perhaps on the order of a few days to a week, and they contain a more diverse artifact assemblage indicative of more on-site activities, as well as more features (McBride 1984:328-329). In sum, settlement patterns of the Late Woodland period are characterized by "1) aggregation in coastal/riverine areas; 2) increasing sedentism, and; 3) use of upland areas by small task groups of individuals organized for specific tasks" (McBride 1984:326).

In sum, the prehistory of Connecticut spans from ca., 12,000 to 350 B.P., and it is characterized by

numerous changes in tool types, subsistence pattern, and land use strategies. For the majority of the prehistoric era, local Native American groups practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Late Woodland period that incontrovertible evidence for the use of maize horticulture as an important subsistence pursuit is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project parcel, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

4.3 History of the Proposed Project Region

The town of Waterford separated in 1801 from New London, itself founded in 1648. The first settlement in what would become Waterford was probably made in the 1660s, on the shore near the southeastern corner of the present town (Crofut 1937). The project area is located in the northwestern part of Waterford, near the head of the Niantic River and the historic bridge and village there. Unusually, Waterford does not appear to have had a separate Congregational church society separate from New London's. Instead, a Baptist congregation was formed in the 1670s, and by the 1830s there were three Baptist churches in the town (Barber 1837). The city of New London was incorporated in 1784, and Waterford's creation as a new town may have reflected the divergence of interests between the city and country populations. Although New London was much involved in wars, from the Pequot War to the Revolutionary War to the War of 1812, most of this activity took place on the east side of the town, where the city and the harbor on the Thames River were located (Crofut 1937). New London (then including Waterford) was the terminus of the Mohegan Road, laid out through the Indian tribe's lands in 1670. Also in the seventeenth century, the Boston Post Road was established, and passed across the head of the Niantic River. In the 1790s, when the state began its efforts to improve transportation routes, the Mohegan Road was made a toll road. In 1800, the General Assembly incorporated the Hartford and New London Turnpike Company, which built a road diagonally from Waterford's northwestern corner to the city of New London. In 1807, the New London and Lyme Turnpike was incorporated to improve the section of the Old Post Road between those two places, with subsequent improvements to bridges along the routes. This turnpike, located a short distance south of the project area, remained in business for some time (Wood 1919). In 1850, a railroad link between New Haven and New London was opened, crossing the Niantic River at its mouth, and by 1858 the "Shore Line" railroad, still partly in operation under a different name, finished a direct rail route between New York and Boston (Turner and Jacobus 1989).

The rural nature of nineteenth-century Waterford is illustrated by its population figures; between 1810 (its first census year as an independent town) and 1910, its population slowly rose from just over 2,000 to just over 3,000. After that year, the population began to rise substantially: to just under 4,000 in 1920, to 9,100 in 1950, to nearly 18,000 in 1990 (MAGIC 1996). These changes are consistent with development trends in the state. During the late nineteenth and early twentieth centuries, the rise of leisure activities led to the development of seaside resorts – hotels, boarding houses, and cottage developments, together with a related rise in the number of year-round residents in shoreline towns. At the same time, declines in fish populations reduced the shoreline's fishing industry, and when faced with competition from western grain and cattle production, regional farmers turned to dairying, fruits, and vegetables or went out of business. As the twentieth century progressed, the trend toward suburban living brought many more permanent residents to Waterford, further boosting the population (Herzan 1997). This is not to say that Waterford had no industrial activity; in 1932, for example, it still had quarrying and "monument work," paper manufacturing, a woollen mill, and bleaching and dyeing, as well as agriculture (Connecticut 1932). The difference is that these businesses were not in urban areas.

Historic maps of the project area indicate that although it was close to the village at the head of the Niantic River, it was not within it. The place-names Oil Mill Brook and Oil Mill Road refer to the nearby presence,

as shown in an 1813 map of the state, of water-powered mills for the preparation of oils from different types of seeds (Warren and Gillett 1813). The 1854 map of the county still shows an oil mill located southwest of the project area. Much closer to the project area were structures belonging to J. P. Beebe and C. Mosier, with a T. Beebe located on the other side of what is now Oil Mill Road. South of the project area, in addition to the oil mill, were the town almshouse and houses belonging to the Stanton family (Figure 4; Walling 1854). In the 1868 map of Waterford, the situation is much the same, although the cartographer portrayed the structures near the project area as being much further apart (Figure 5; Beers 1868). The 1934 aerial photograph shows that the project area was in a large, cleared agricultural field, which was crossed by a small stream and a northerly-southerly direction. The general vicinity of the project area included agricultural fields, forests, and reforesting parcels, as well as the cluster of houses to the southwest (Figure 6). This aerial photograph also has marked on it the plans for improvements to Route 1, which had already developed significant traffic problems by the 1920s. Despite the powerful need for an improved traffic route along the shore, however, plans for I-95 were not finalized until 1954, and it did not open until 1958, incorporating a number of earlier improvements to Route 1 (Oglesby 2007). The 1951 aerial photograph shows the constructed improvements to Route 1, immediately south of the project area; except for some increase in forestation in the area, little else had changed, except for the power line right of way that is visible north of the project area (Figure 7).

The 1970 aerial photograph shows the results of the construction of I-95, including the access ramp and new secondary road paralleling the highway, immediately south of the project area. In addition, the project area was one of a much smaller number of cleared fields in the area, and there was some noticeable housing construction in the area (Figure 8). By 2004, almost all the fields in the area had become reforested, including the project area; there was some further housing and commercial construction, but much of the vicinity still remained open space (Figure 9). Waterford remains a town with considerable development near the shore and New London, but still with large areas of undeveloped land in the interior, even near the major transportation routes. The project area itself does not appear to have been used for any purposes other than agricultural, based on the documentary evidence.

4.4 Previous Investigations

As mentioned above, the current effort also involved an examination of State Historic Preservation Office records as they pertain to archeological sites, historic standing structures, and National Register Properties situated within or immediately adjacent to the Area of Potential Effect. This literature review revealed that there are 4 historic (45-39, 152-37, 152-75, and 152-134) and 4 prehistoric (45-25, 45-40, 152-108, and 152-129) previously identified archeological sites situated within 0.8 km (0.5 mi) of the Area of Potential Effect (Figure 10). Of the prehistoric sites, only Site 45-40 has a known temporal affiliation with the Late Archaic. The historic sites date from the seventeenth through twentieth century. Site 152-37 was recorded as the remains of an abandoned eighteenth century grist mill, while Site 152-75 is a currently occupied residence dating from the late seventeenth century. The two remaining historic sites (152-134 and 45-39) are described as historic artifact scatters. None of these previously identified cultural resources were assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Furthermore, none of these cultural resources are situated within or immediately adjacent to the project parcel. Finally, there is no record indicating that the project parcel has been subjected to a cultural resources survey in the past.

5.0 Results of the Pedestrian Survey

In addition to the above-referenced archival research and literature review, personnel representing Heritage Consultants, LLC completed a pedestrian survey of the proposed project parcel. During that review, the Area of Potential Effect was visually reconnoitered, photo-documented, mapped, and assessed with the results of the background research and its likelihood to produce intact cultural deposits. The result of the field effort is reviewed below.

Pedestrian survey and photo-documentation of the Area of Potential Effect confirmed the results of archival research and literature review that much of the proposed project parcel has been subjected to only minimal impacts from previous landuse. Walkover survey and photo-documentation of the proposed project parcel revealed that areas of substantial disturbance were limited to the immediate vicinity, approximately 5 to 10 m (16 to 32 ft) of the bounding roads (Figure 11). As such, these areas retain only a low to moderate potential to yield intact cultural deposits.

As shown in Figures 12 through 16, pedestrian survey and photo-documentation of the remainder of the project area revealed that the majority of the parcel is characterized by relatively level topography, well-drained soils, and proximity to perennial water sources. Furthermore, the property contains numerous rock walls, as well as a rock lined water way that likely is associated with the previously recorded grist mill mentioned above (Figures 15 and 16). Given these cultural features, natural qualities, and lack of obvious disturbance to this area, the remainder of the project area retains moderate to high sensitivity for containing intact cultural deposits.

6.0 Summary

In sum, pedestrian survey, photo-documentation, and mapping of the proposed project parcel confirmed the results of the archival research and literature review portions of the current project. That is, the current fieldwork revealed that much of the Area of Potential Effect retains natural characteristics (e.g., level topography, well-drained soils, and access to freshwater) that would have made it attractive to past human occupation and landuse. Furthermore, evidence of past human activity, such as rock walls and a rock-lined waterway, were noted on the property. As a result, the majority of the property parcel was determined to retain a moderate to high sensitivity for containing intact archeological deposits. Finally, substantial disturbance were noted in the immediate vicinity, approximately 5 to 10 m (16 to 32 ft) of the bounding roads. As such, these areas retain only a low to moderate potential to yield intact cultural deposits.

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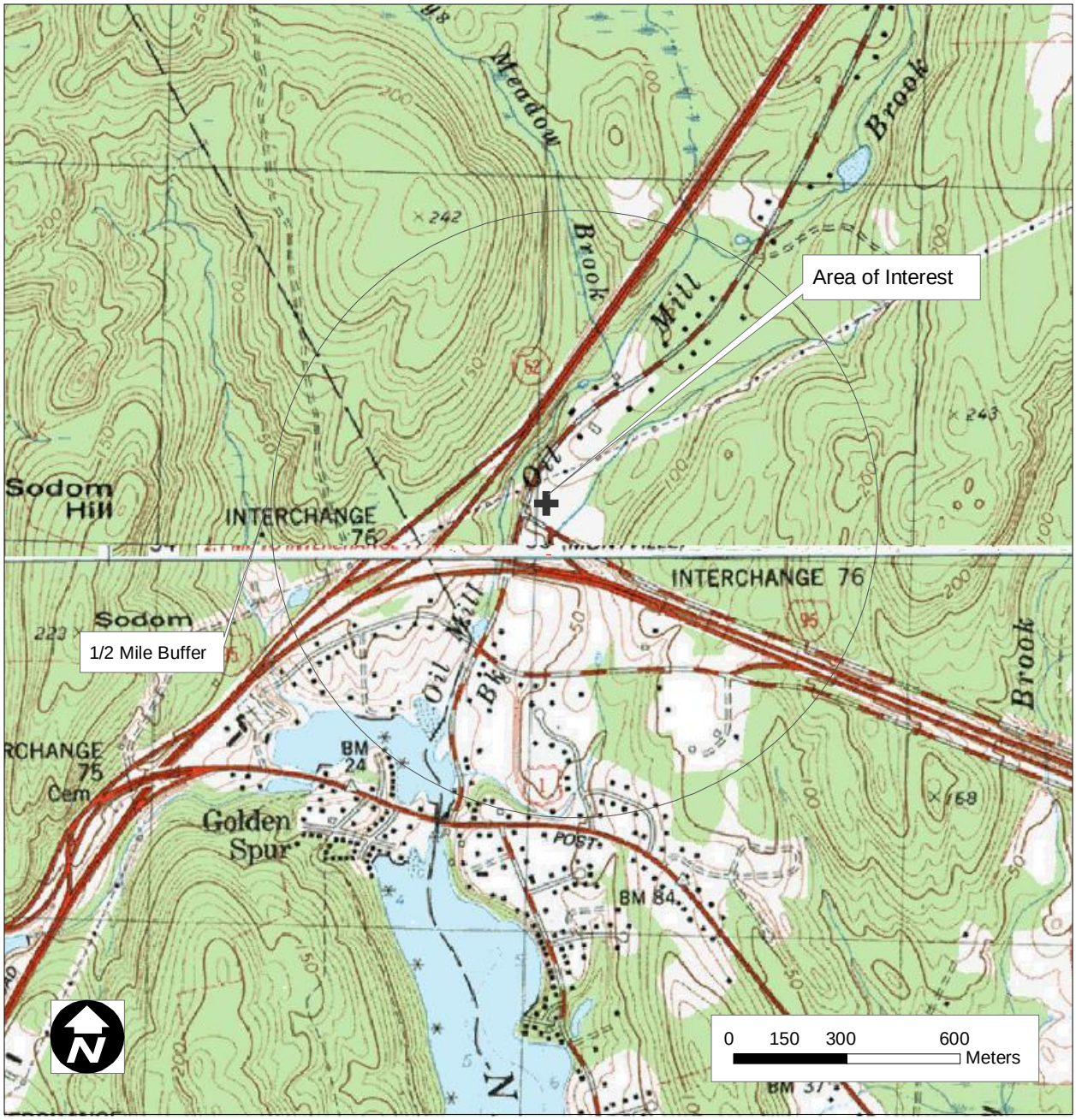

Figure 1. Excerpt from a recent USGS 7.5' series topographic map depicting the approximate location of a proposed development in Waterford, Connecticut.

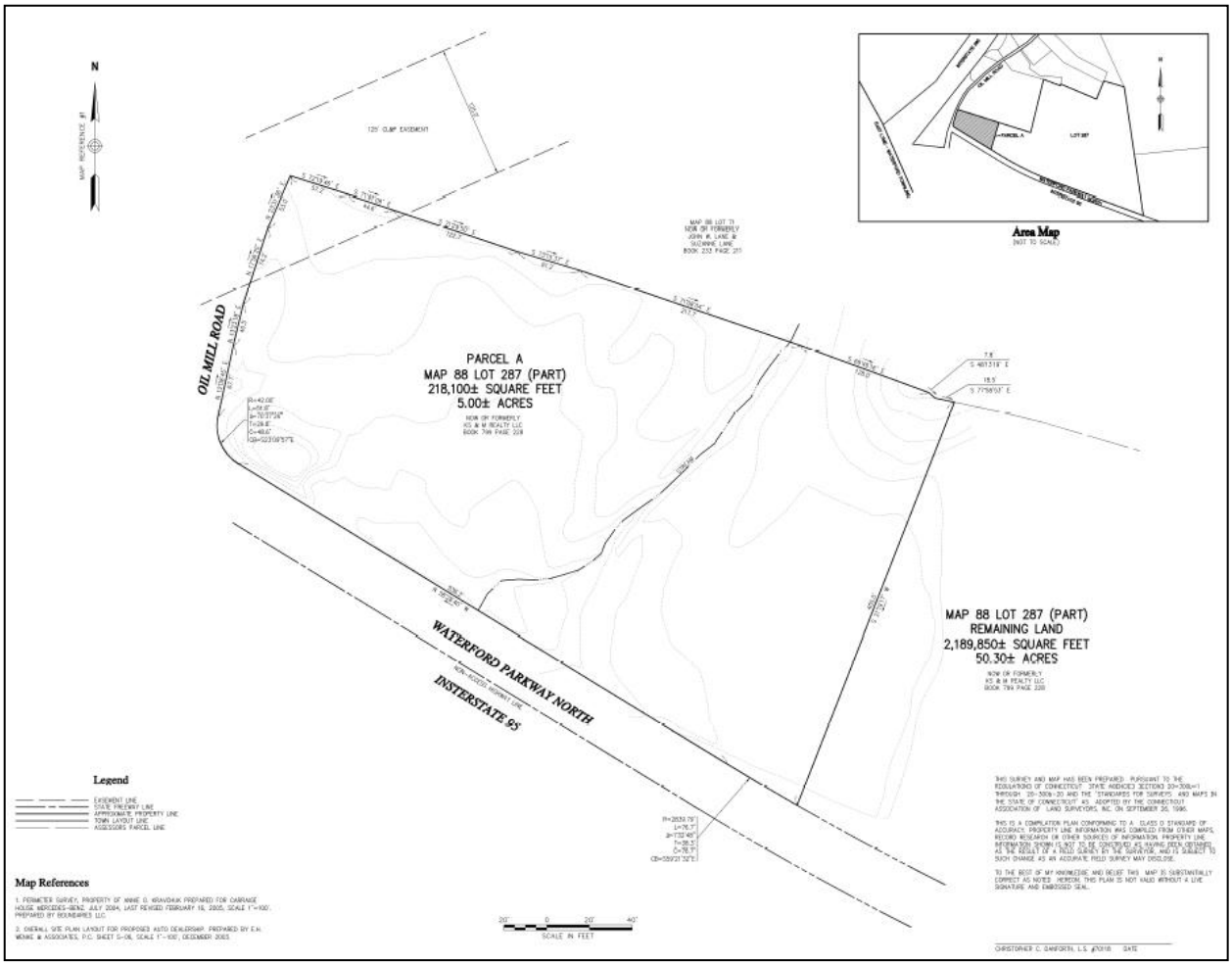

Figure 2. Project parcel map depicting the approximate location of a proposed development of Parcel A in Waterford, Connecticut.

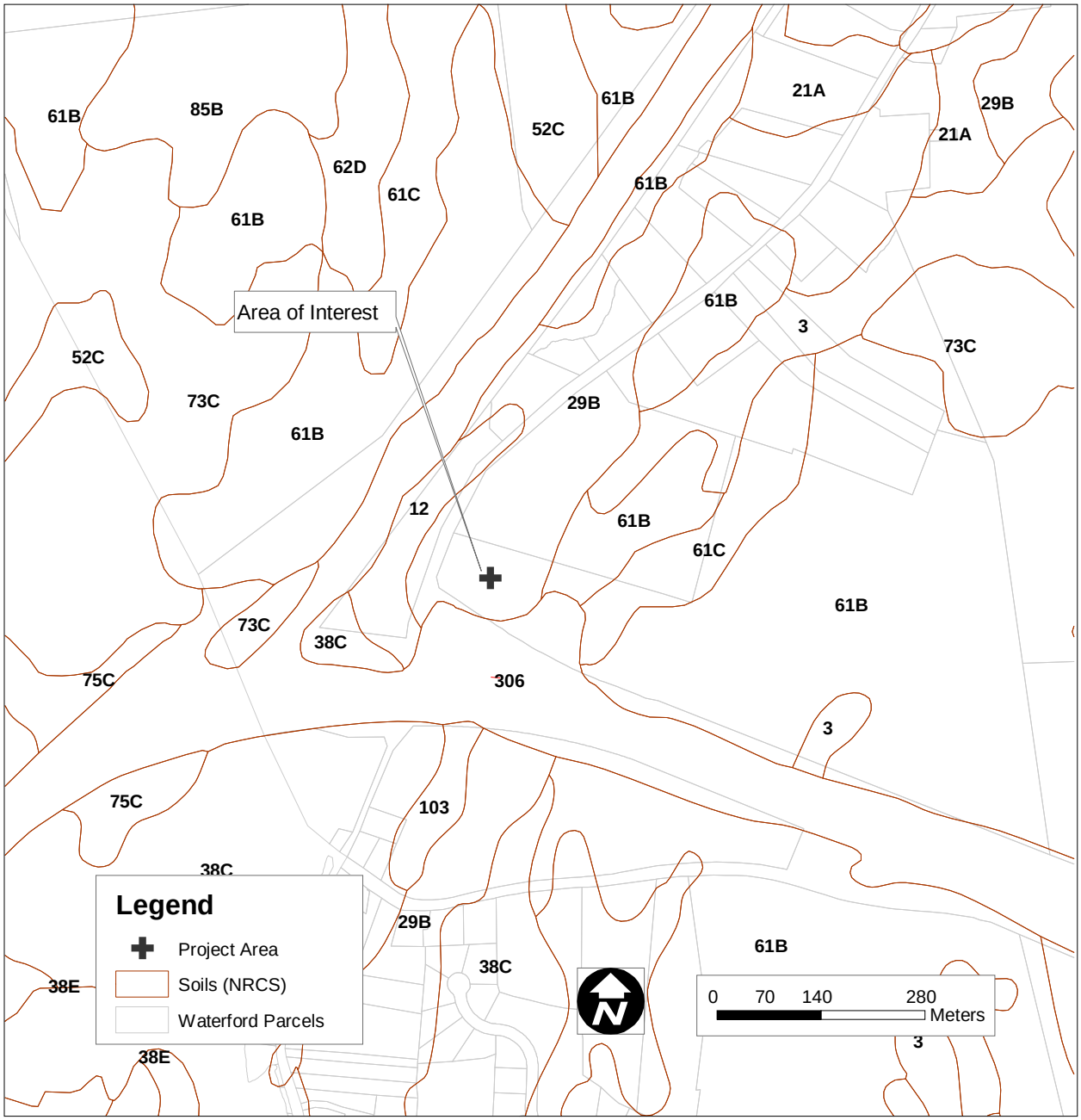

Figure 3. Soil types situated in the vicinity of a proposed development in Waterford, Connecticut (Note Soil Code 29B is Agawam fine sandy loam and 306 is Udorthent soils).

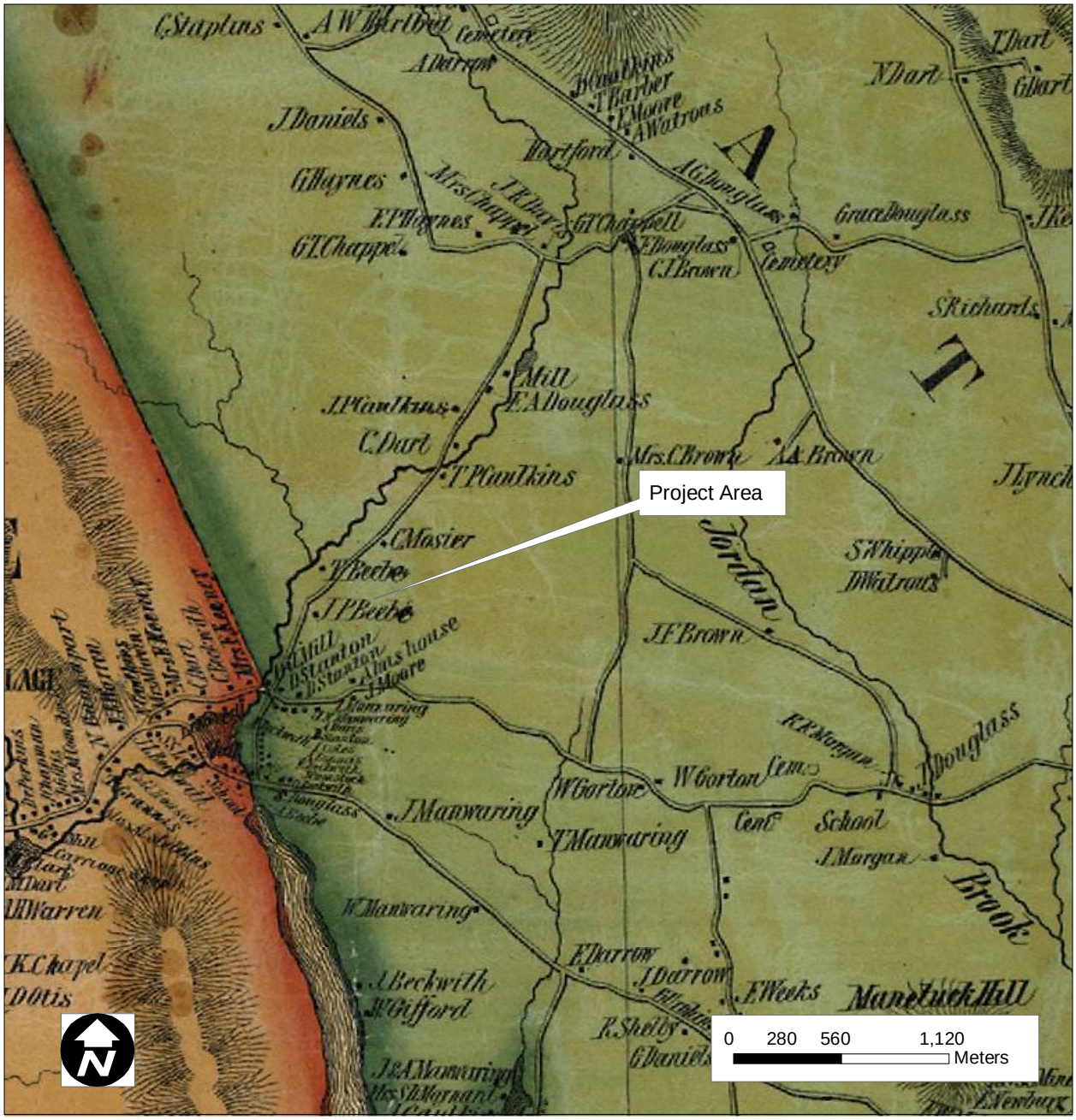

Figure 4. Excerpt from an historic 1854 map depicting the approximate location of a proposed development in Waterford, Connecticut.

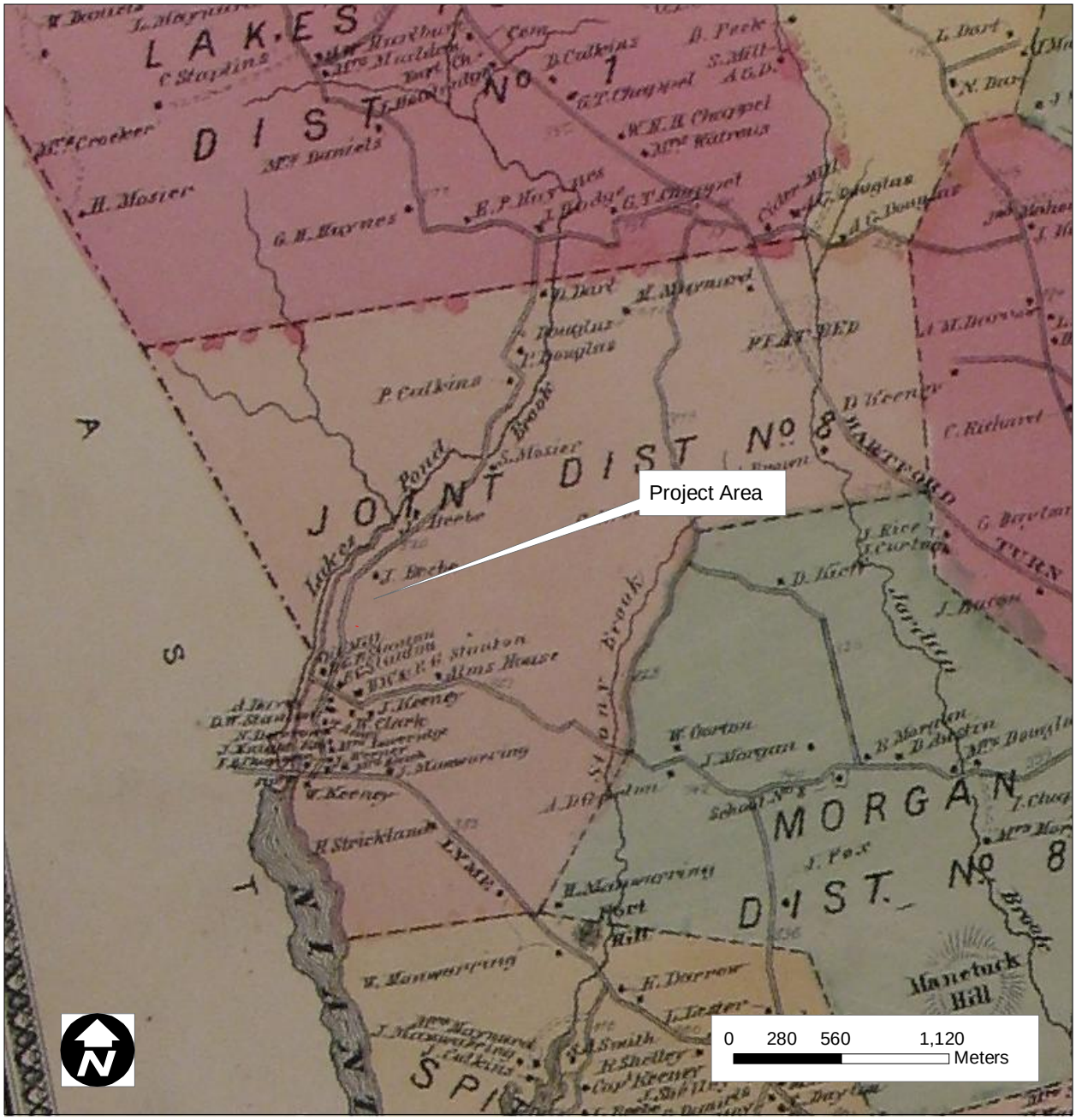

Figure 5. Excerpt from an historic 1868 map depicting the approximate location of a proposed development in Waterford, Connecticut.

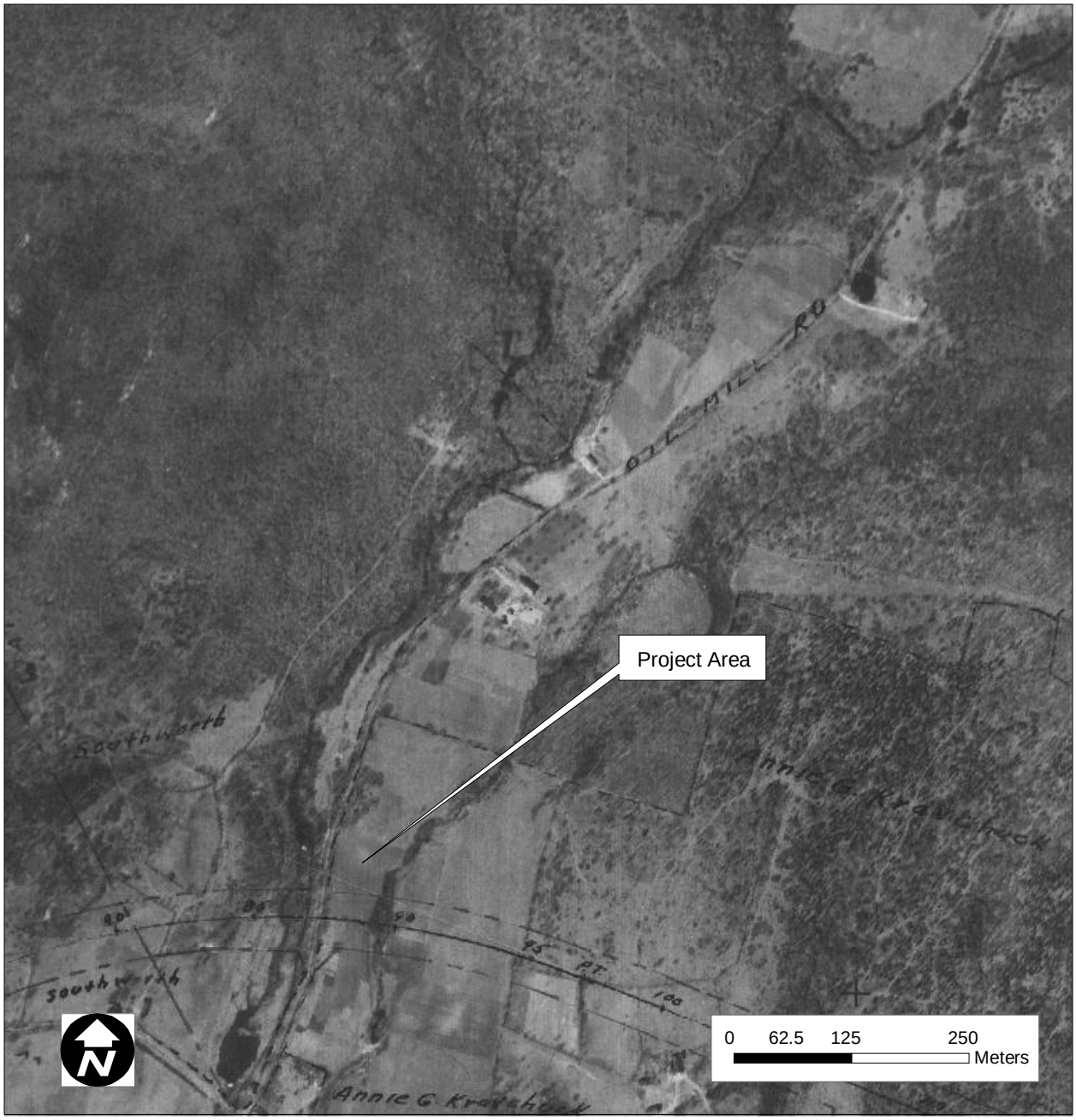

Figure 6. Excerpt from a 1934 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

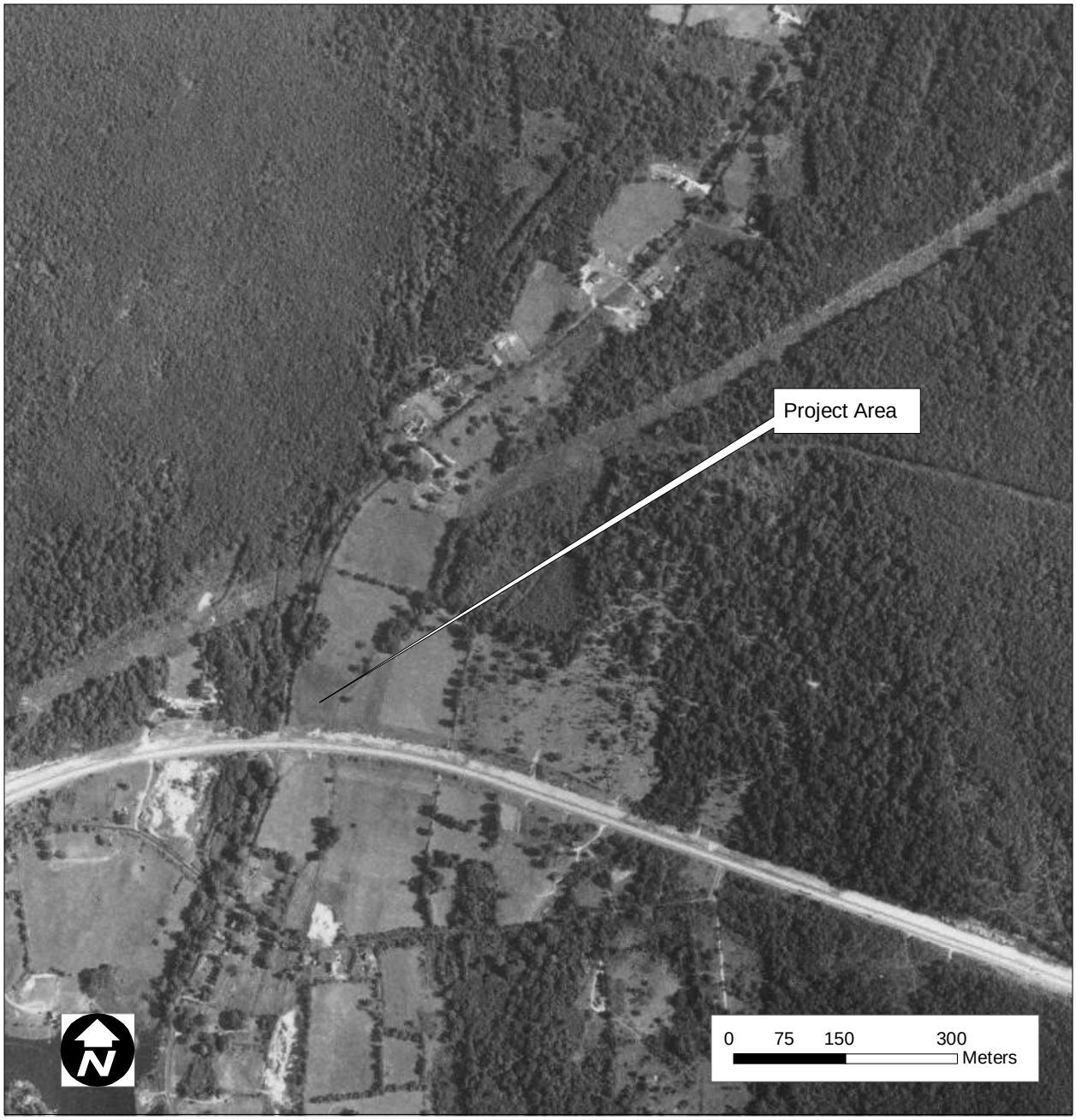

Figure 7. Excerpt from a 1952 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

Figure 8. Excerpt from a 1970 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

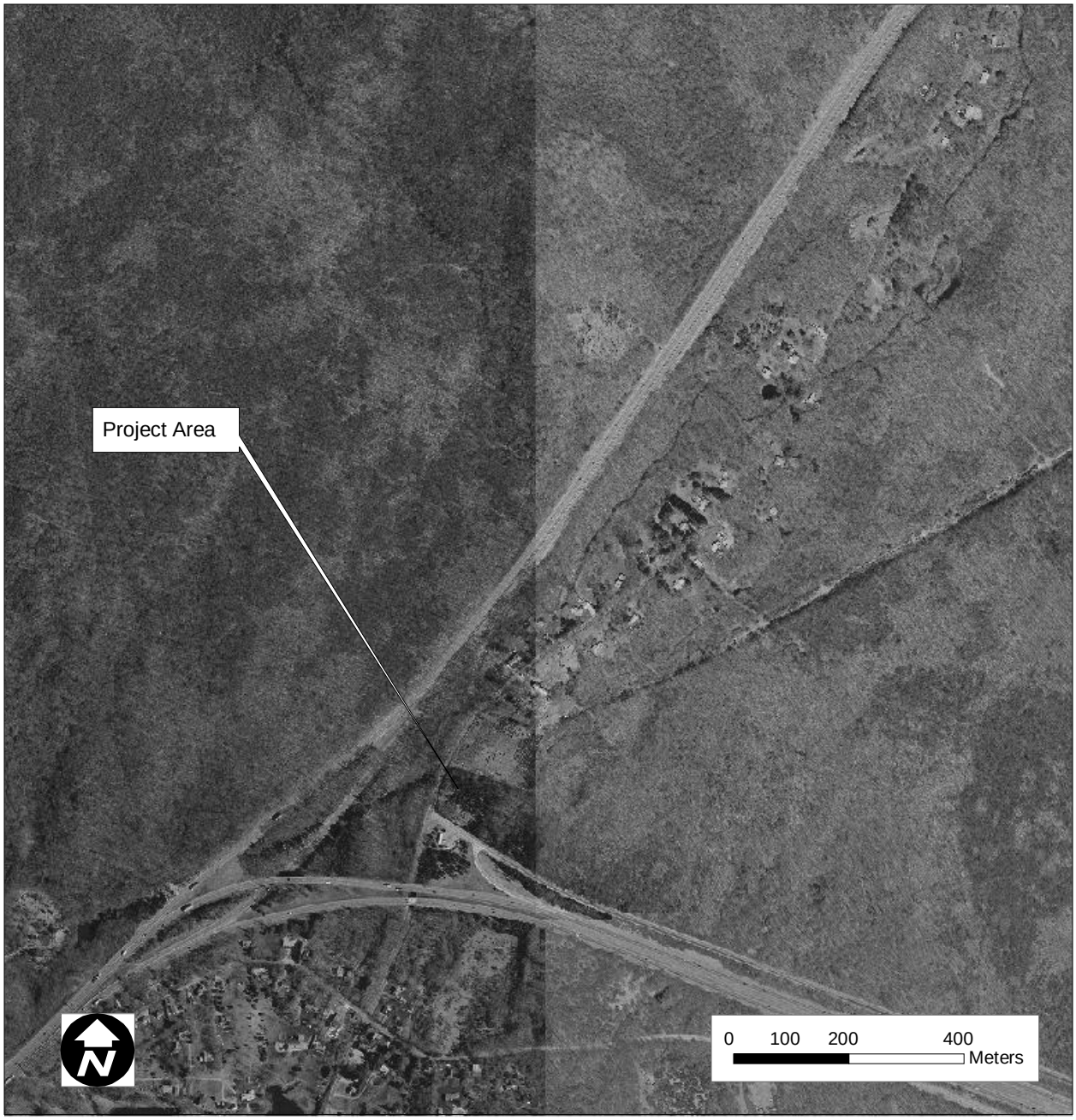

Figure 9. Excerpt from a 2004 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

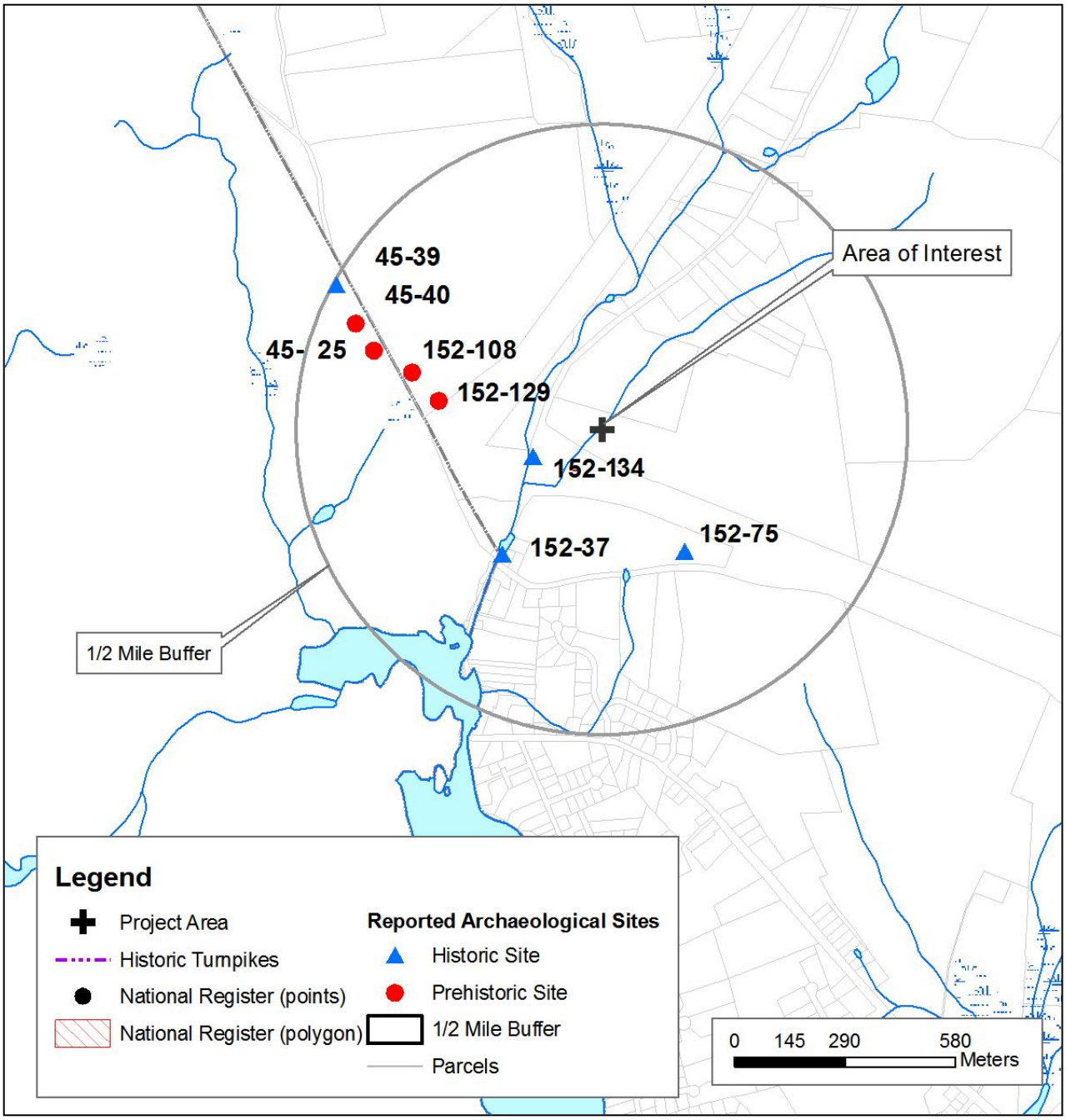

Figure 10. Map of previously identified cultural resources situated in the vicinity of a proposed development in Waterford, Connecticut.

Figure 11. Overview photo of the proposed project parcel facing southeast along Waterford Parkway North.

Figure 12. Overview photo of the proposed project parcel facing northwest from the eastern parcel boundary.

Figure 13. Overview photo of the proposed project parcel facing southeast from the western parcel boundary.

Figure 14. Overview photo of the proposed project parcel facing southwest from the northeastern parcel boundary.

Figure 15. Overview photo of the proposed project parcel facing north along the eastern parcel boundary.

Figure 16. Overview photo of the proposed project parcel facing south from the northern parcel boundary.

Appendix E
CTDEP Correspondence

Northeast Utilities System

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-4861

January 15, 2008

Ms. Dawn McKay, Biologist/Environmental Analyst
Connecticut Department of Environmental Protection
Natural Resources Center
Environmental and Geographic Information Center
Natural Diversity Data Base
79 Elm Street, Store Level
Hartford, CT 06106-5127

Re: Proposed Substation
287 Waterford Parkway North
Waterford, Connecticut

Dear Ms. McKay:

The Connecticut Light and Power Company ("CL&P") is considering the development of a new 115-kV substation for interconnection with existing overhead transmission facilities off Waterford Parkway North, in Waterford, Connecticut (the "Site"). The new substation is necessary to meet an increasing demand for electricity in the Waterford area. The proposed development of a new substation requires CL&P to submit an application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need. Consultation with your office is part of the application process.

The 5-acre Site currently exists as undeveloped land and is covered with moderate tree growth, with some small clearings and limited growth in its central portion. An easement area with overhead electric transmission lines is present in the northwest corner of the Site. The new 115-kV substation facility will interconnect with the existing transmission lines that extend generally east to west immediately north of the Site.

CL&P has reviewed the Natural Diversity Data Base's (NDDB) December 2007 GIS layer of "State and Federally Listed Endangered, Threatened, and Special Concern Species and Significant Natural Communities", and based on your criteria, we have determined that our proposed project does **not** present a potential conflict with *a listed species or significant natural community* (please refer to the attached NDDB Screen map).

We respectfully request your written concurrence with our findings to support our application with the Connecticut Siting Council. At your earliest convenience, please forward the correspondence to my attention. Thank you in advance for your prompt consideration of this request. Should you have any questions, I may be reached at (860) 665-4861 or via email at marotsa@nu.com.

Sincerely,

NORTHEAST UTILITIES SERVICE COMPANY

Scott A. Marotta
Environmental Scientist

Enclosures

cc: D. Biondi, Northeast Utilities Service Company

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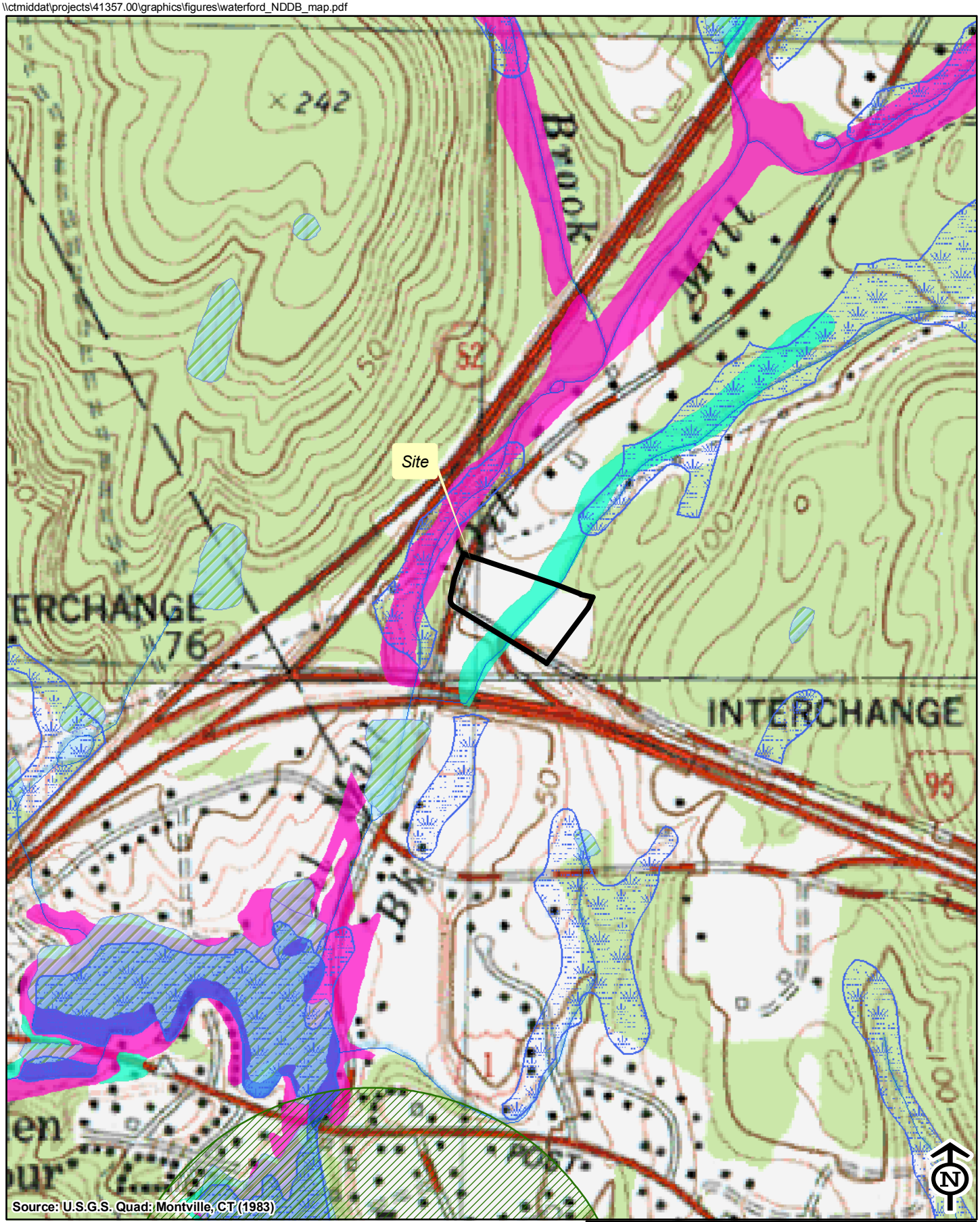

Legend

- Site
- NDDB Areas (buffered; last updated Dec 2007)
- Connecticut Wetlands
- National Wetland Inventory Wetlands
- Open Water

FEMA Flood Zone

- 100 Year Flood Zone
- 500 Year Flood Zone
- Floodway in Zone AE
- Other Flood Areas

500 250 0 500 Feet

Vanasse Hangen Brustlin, Inc.

Natural Diversity Database (NDDB)
State and Federally Listed Endangered, Threatened, and Special Concern Species and Significant Natural Communities Screen
Proposed Substation
Waterford Parkway North & Oil Mill Road
Waterford, CT
January 2, 2008

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

January 28, 2008

Mr. Scott Marotta
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270

Re: Proposed Substation, 287 Waterford Parkway North, North Waterford

Dear Mr. Marotta:

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed new 115-kV sub-station for interconnection with existing overhead transmission facilities off Waterford Parkway North in Waterford, Connecticut. According to our information there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base. Also be advised thatthis is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Sincerely,

Dawn M. McKay
Biologist/Environmental Analyst

DMM/blm